BIRDS OF MASSACHUSETTS AND OTHER NEW ENGLAND STATES

EDWARD HOWE FORBUSH

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BIRDS OF MASSACHUSETTS

AND OTHER NEW ENGLAND STATES

BY

EDWARD HOWE FORBUSH

PART III. LAND BIRDS FROM SPARROWS TO THRUSHES

Illustrated with Colored Plates from Drawings by
LOUIS AGASSIZ FUERTES
AND
ALLAN BROOKS
AND
Figures and Cuts from Drawings and Photographs

With a Biographical Sketch of
EDWARD HOWE FORBUSH
BY
JOHN BICHARD MAY

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1929

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Norwood Press
J. S. Cushing Co. — Berwick & Smith Co.
Norwood, Mass., U.S.A.

COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF AGRICULTURE

It is with a feeling of deep pride and satisfaction that we witness the completion of the three volumes of "The Birds of Massachusetts and Other New England States" but this satisfaction is tempered by our keen sense of loss in the passing of their gifted author, Edward Howe Forbush.

Mr. Forbush first became associated with the State Board of Agriculture, as it was then called, in 1893. The value of his studies of economic ornithology was quickly recognized and his work increased in importance during his association of thirty-five years with this department. He accomplished a vast amount of educational work through the medium of his lectures and publications on the relation of birds to mankind.

Coincident with his advance as an economic ornithologist was his interest in and work for conservation. He was a pioneer in this field and much of our progressive legislation of to-day is due to his far-sighted policy in urging greater protection for our wild life and to his efforts in stimulating public opinion in this direction.

The culmination of his lifetime of study of birds is found in the three volumes of "The Birds of Massachusetts and Other New England States." At the time of his retirement as Director of the Division of Ornithology, a position which he had held since the organization of the present Department of Agriculture, Mr. Forbush was busily engaged in preparing the manuscript for the final volume of this great work. Ten months later, the manuscript almost completed, he laid down his pen for the last time.

The passing of Edward Howe Forbush was a very distinct loss to ornithology and to conservation, but the effects of his work will live long after him. Those of us whose privilege it was to be associated with him in the Department of Agriculture will long remember his cheery presence, his quiet sense of humor, his deep and sympathetic interest in his fellow workers, and the intensity of his devotion to his chosen work. To all of us this book will be the best and most fitting monument to Edward Howe Forbush.

Arthur W. Gilbert,
Commissioner.

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PREFACE

THE editor of a posthumous volume is under a handicap in endeavoring to express the feelings of the author of the book to the many individuals who assisted in its preparation. Fortunately, I had come to know Mr. Forbush rather intimately during the several years immediately preceding his death, when it was my privilege to act as his assistant in preparing material for these volumes.

Edward Howe Forbush was a man of great attainments in the fields of economic ornithology and of wild life conservation, but he was also a man of great modesty. While he was continually consulted by scientists of the highest standing as well as by the veriest tyros in bird study, he was always ready to give full credit to those who had contributed in any way to his fund of information. It was his intention to acknowledge his indebtedness to all those who had assisted him, in the preface of the third volume of "The Birds of Massachusetts." It is not possible for me to name all those to whom Mr. Forbush felt indebted, but all who assisted him and whose work is not herein acknowledged, will have the satisfaction of knowing that they have made a contribution to a work of real value, which has added to the knowledge and pleasure of countless individuals.

First to whom Mr. Forbush tendered grateful recognition was his wife, to whom he was married in 1882 and who survives him. Throughout the long period of their life together, Mrs. Forbush not only encouraged him in his chosen work, but was of much assistance to him in many ways. Although crippled by illness in recent years, she spent many long hours in reading and revising his manuscript and in painstaking correction of the proof of "The Birds of Massachusetts," and her criticisms were always constructive and helpful.

To his associates in the Massachusetts Department of Agriculture Mr. Forbush has already expressed his appreciation. Dr. Arthur W. Gilbert, Commissioner of Agriculture, aided the preparation of these volumes from their inception, appearing at legislative hearings to ask for ample appropriations, relieving Mr. Forbush as far as possible of the necessity of giving his time to the routine matters of the Division of Ornithology, and assisting in many other ways. Those others of us who have worked with Mr. Forbush in the Division of Ornithology feel, however, that our association has been a valued privilege and that the obligation is all on our side. Chief among his assistants was Mr. John A. Farley, a life-long friend of Mr. Forbush and an ornithologist of note, whose assistance in planning the scope of the work and in working out the details of the plan, was only equaled by the value of his editorial labors. His wide scientific knowledge was a storehouse of facts upon which Mr. Forbush placed great reliance. For many years Mrs. Alice

B. Harrington acted as Mr. Forbush's secretary and by her interest relieved him of much of the office detail. Others who aided in the preparation of the manuscript for the three volumes were Prof. James Mackaye, Mr. Maurice Broun, Miss Florence Pease, Mrs. Helen M. Ross, Mrs. Jennie M. Holmes and the present writer.

In the course of his investigations into the bird-life of New England Mr. Forbush enlisted the coöperation of a very large force of volunteer workers, who reported to him at irregular intervals their observations of birds. From the great amount of material gathered by these observers, Mr. Forbush sorted out the wheat from the chaff and found it a source of much interesting and valuable data. Between eight hundred and a thousand names appear on the roster of these observers and it is of course impossible to acknowledge individually their assistance. Many of these observers' names appear in the books, however, as reporting interesting items or records, and Mr. Forbush considered their aid as of great value.

Special acknowledgment is due to Dr. Harry C. Oberholser of Washington and to Mr. J. H. Fleming of Toronto, Canada, who gave freely of their time and knowledge in revising the "Ranges" of all the birds treated in the three volumes. Others, notably Dr. Charles W. Townsend of Ipswich, Massachusetts, read and corrected parts of the manuscript.

Deep obligation is felt to the officials of various museums whose facilities were so freely offered, chief among these being the National Museum at Washington, the Museum of Comparative Zoölogy of Harvard University, the Boston Society of Natural History, the American Museum at New York, the Academy of Natural Sciences at Philadelphia and the National Memorial Museum at Ottawa, Canada. Many private collections were also placed at the disposal of the author, especially those of Col. John E. Thayer, Mr. Arthur C. Bent, Mr. Frederick H. Kennard and the late Dr. Jonathan Dwight.

A special debt is owed to Mr. Laurence B. Fletcher, Mr. Charles B. Floyd and the other officers of the Federation of the Bird Clubs of New England, who were so largely responsible for ensuring the legislation which authorized the publication of these volumes, and for their constant aid and friendly coöperation in countless details. Recognition is also due to Dr. T. Gilbert Pearson and the National Association of Audubon Societies, who rendered assistance in many ways and who, upon Mr. Forbush's retirement at the age of seventy, immediately offered him a salary as their New England field agent with instructions to make the completion of this volume his first work.

Permission has been given by many authors and publishing houses to quote from their publications and reference is made throughout the three volumes to the source of most if not all of the material so quoted.

The illustrations, which add so much to the value of the books, are the result of willing coöperation of many people. Sixty-eight of the color plates were from the inimitable brush of Louis Agassiz Fuertes, whose sad passing Mr. Forbush felt as a deep personal loss. Twenty-four plates were painted by Major Allan Brooks, whose generous attitude while completing the final paintings deeply impressed Mr. Forbush. Most of the photo-

graphs used for the halftone figures were contributed by the photographers, to whom credit is given under the reproduction. The line drawings and maps were the work of Mr. Forbush or of Major Brooks, Mr. W. I. Beecroft or the present writer.

To the Quadri-color Company of Jamaica, New York, much credit is due for the excellence of the color reproductions, in which work the manager, Mr. H. A. Obst, took the keenest personal interest. Similar interest was shown by Mr. H. E. Washburn of the Suffolk Engraving Company of Cambridge, under whose supervision the halftones and line cuts were prepared. The three volumes also reflect the excellent work of the J. S. Cushing Company of Norwood, Massachusetts, the printers, and the ever courteous coöperation of Mr. James S. Cox, treasurer of that company, who at all times gave his personal attention to the details of the printing and binding of the books.

And finally, the present writer wishes to acknowledge his own indebtedness to the many friends of Mr. Forbush who have continued to send their notes to his official successor and to all those who have assisted him in any way in his attempt to carry to its conclusion the publication of this final volume of "The Birds of Massachusetts and Other New England States."

JOHN BICHARD MAY.

NOVEMBER, 1929.

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EDWARD HOWE FORBUSH, FRIEND OF THE BIRDS

A BIOGRAPHICAL SKETCH

By John Bichard May

In the heart of the Taconic Mountains, at the extreme western edge of the Commonwealth of Massachusetts, a brawling mountain stream comes rushing down a steep wooded valley. On either side the forested hills rise a thousand feet, great beeches and sugar maples, birches and hemlocks sheltering a dense undergrowth of moosewood, cornels and mountain laurel, while under these the ground is covered with ferns and wild flowers. Here in spring we find the wake robin and spring beauty, the showy orchis and pink moccasin, the snowy bloodroot and the modest wild ginger, literally carpeting the ground. From overhead we hear the lisping calls of wood warblers gleaning insects among the tender new leaves of the towering trees, in the undergrowth the Peabody-bird scratches the dead leaves or mounts a branch to whistle his sweet song, Juncos smack and trill in the hazel thickets, and from across the valley come faint but clear the silvery notes of thrushes, blending with the tinkling song of the Winter Wren and the murmur of the myriad little waterfalls along the brook. Here in fall great masses of purple joe-pye-weed and rank growths of jewel-weed conceal the now diminished stream, squirrels chatter in the oaks and beeches, Blue Jays noisily proclaim their presence, while high overhead a lone hawk circles lazily. Treading quietly among the falling leaves we may surprise a snowshoe rabbit in its form beneath a fallen tree, or see in the soft earth the tracks of a buck or doe, startled from its browsing by our approach.

This is the Edward Howe Forbush Sanctuary, a tract of land set aside forever as a wild life reservation in memory of the man who has done so much to awaken an interest in and appreciation of the out-of-doors, and who was a pioneer in the movement to protect and increase the wild birds and animals of New England. It is a fitting memorial to one who loved Nature in all its phases and whose happiest moments were spent in roaming just such woodland regions, watching the unfolding of the leaves and the opening of the flowers, studying the intimate details of the lives of its feathered and furred inhabitants and noting the ever-changing procession of the seasons.

Edward Howe Forbush, author of "The Birds of Massachusetts and Other New England States," came of a long line of New England forebears. His ancestry is readily followed back to about the year 1660, but there the record becomes hazy and circumstantial evidence must be considered in attempting to link the family with its progenitors in Old England.

The first of the family in New England was Daniel Forbes, whose name appears in the early town records on several occasions, though under various spellings. He is believed to have been a native of Scotland, born about 1620, and there is considerable foundation for the belief expressed by Frederick Clifton Pierce, chronicler of the Forbes and Forbush Genealogy, that he was one of the eight thousand or so Scotch soldiers who were deported to New England by Oliver Cromwell following the disastrous battle of Dunbar on September 3, 1650.

The ancient records of the little town of Kinellar, near Aberdeen in Scotland, under date of June 15, 1655, make reference to one "Andro Forbes in Kinellar, heir to Daniel Forbes." From the wording of this record, Daniel Forbes was the uncle of Andro. Apparently he was not definitely known to be dead at that time, but was undoubtedly absent from Kinellar. Such reference might easily have been made to a soldier who, following the defeat at Dunbar, was absent from home, and whose property was very probably in danger of confiscation because of his participation in that battle.

It is known that men of the name of Forbes settled, at about this time, near Kittery, Maine, where they had been sent by Cromwell's orders. The first definite record of Daniel Forbes in this country, of which we have knowledge, appears on March 26, 1660, in the archives of Cambridge, Massachusetts, to which town some of the Kittery emigrés are known to have removed shortly after their arrival in America. On that date the records show that "Daniel Forbes" was married to one Rebecca Penniman. Daniel was apparently unable to write even his own name (a common condition in those days), as is evidenced by the fact that he affixed his mark to this and other later legal papers; and the recording clerks before whom he appeared, listening to his broad Scotch burr, generously added a few letters each time they wrote his name for him. Thus the name "Daniel Ffarrabas" appears on the records in 1664 and 1665; in 1668 we find "Daniel Fferebas" employed by one Edmund Angier, to whom, in 1671, "Daniel and Rebecca Ffarabas" conveyed certain land. On another somewhat later deed the record reads "Daniel (his X mark) Farrabas." Eventually Daniel removed from Cambridge to Marlborough, where he died in 1687, and somewhat later the marriage was recorded there of "Mrs. Daniel Farrowbush" and Alexander Stewart.

From this point on the records are clear, but the confusion in spelling persisted for another generation at least. Thus we find the five sons of Daniel recorded as Daniel Furbush or Ffarbish, Thomas Forbush, Ffarbush or Forbes, Samuel Forbush, John Forbush, and Jonathan Forbush, Farbush, Forbes or Farabush. The third son, Captain Samuel Forbush, was born about 1674 and lived for some time in Marlborough, later removing to Westborough, where the family has been represented ever since under that spelling of the name. He was one of the original members of the Westborough Church, and his wife Abigail was one of the first women to be admitted to membership in the church after women were permitted that privilege. He was evidently a man of considerable influence, holding several offices in the town government at different times and being one of its selectmen in 1723.

The first Captain Samuel was followed in Westborough by his eldest son, the second Captain Samuel, and the name was passed on to a third Samuel, born there January 13, 1733, and a fourth, born August 25, 1771. This last Samuel Forbush became a prosperous farmer, shipping his meats and produce regularly to the Boston markets. He died in 1827. His son, Lowell Forbush, who was born August 16, 1801, also lived in Westborough until his death in 1880.

Leander Pomeroy Forbush, son of Lowell Forbush and father of Edward Howe Forbush, was born on February 16, 1829, in Westborough, the home of five generations before him, but unlike his forebears he did not remain in that town all his life. He was educated in the public schools of his native place and then became a teacher, a profession which he followed successfully for a number of years. He was married on June 10, 1855, at Pembroke, New Hampshire, to Ruth Hudson Carr, and they had two children, Edward Howe Forbush, who was born April 24, 1858, and Elizabeth Adelaide Forbush. His first wife died in 1881 and he was married a second time to Lavina Pitman at Bartlett, New Hampshire, May 5, 1883, and a third time to Isabel Clarke at Worcester, Massachusetts, June 7, 1894.

In 1858, at the time his son Edward was born, Mr. Forbush was living in that part of Quincy, Massachusetts, which is now known as Atlantic, and he was principal of the Coddington Grammar School in Quincy. Shortly after Edward's birth the family moved nearer the center of the town for a few years. In 1865 Mr. Forbush became principal of the Florence School at Roslindale and moved with his family to West Roxbury, now a part of the city of Boston. About five years later Mr. Forbush gave up teaching and removed to Worcester, Massachusetts, where he entered business, and where he died on January 19, 1902.

The birthplace of Edward Howe Forbush was located not far from the shore of Quincy Bay. The sparkling waters, the broad salt marshes, the sunny beaches must have made an ineffaceable record on the child's mind, for in later years he wrote:

"The song of the sea has ever called to men. Those who have once heard the call will not soon forget. Those bred on its shores and exiled from them must always long for the sound of the restless waves as they beat upon solid rock or shifting sands. Always the call is the same. The swing and swash of the old salt sea speak to us of romance and adventure, of far-off lands, of the deeds of sea rover and buccaneer. No one knows, when he essays a voyage, what adventure may befall him.

"Born on the shore, I have ever heard its call. To me the sea means life, and health, but I have always preferred the boat under my own control rather than the ship commanded by another. Let me be free to come and go, to turn this way or that. That is the life! It makes men. If one must die, death beneath the waves is quick and merciful. If one must live, there is no richer life than one lived by sea and shore."

Although his family moved away from Quincy when Edward was only seven years of age, already his taste for exploration and adventure had begun to make itself manifest. Across the wide waters of the island-dotted bay he could look off and see the towering

masts of sailing ships and the smoke of steamers, bound out of Boston for all the ports of the seven seas. With such a prospect opened before him, is it to be wondered that he early felt the urge to travel uncharted waters?

One of his earliest recollections relates to a lonely voyage of adventure which he attempted one memorable day, his boat an old abandoned sugar box, without sail or rudder and with only a bit of broken board for a paddle. In this rude craft he drifted with the falling tide down the winding channel of Quincy Town River, and if a couple of older boys had not seen him as he passed the last bridge before his narrow stream entered the open bay, waded out on a sand bar and towed him ashore, this account of his life might never have been written, for the voyage might have ended in tragedy then and there.

This trip, made when he was only six years of age, Mr. Forbush, recalled with amusement when he had passed the allotted three score years and ten, but there was a tradition in his family that it was not his first adventure and that a year or two earlier, on a ramshackle raft, he had attempted to cruise about the flooded salt meadows at the mouth of the Neponset River, near his birthplace.

Edward was but seven when the family moved to West Roxbury and as he said "the call of the sea was then replaced by the call of the woods." West Roxbury in 1865 was a decidedly rural community, though it is today a compactly built-up suburb. It was an almost ideal country for a small boy with the love of outdoor things in his blood. Much of the region was covered with areas of second-growth oak and beech, maple and birch, with occasional tracts of great white pines scattered here and there, and with many cut-over places grown up with bushes and small saplings, which were the favored habitats of different species of birds and beasts. Farmlands and orchards were common in the district, and on the west it was bounded by the wide fresh-water marshes of the Charles River. The entire district, except near the river, was rough and broken, and in the woods were many ledges and outcrops of the famous "Roxbury puddingstone" and of slate, which furnished abundant small caves for foxes, skunks and raccoons. Although the highest elevation was only a little more than three hundred feet above sea level, from its summit the ocean could be seen, and a wide-spreading panorama of city and town, of farmlands and verdant forests.

Here the youngster's outdoor tastes and his love of adventure found a happy field for their development. Except in summer, he has said, six hours a day were required for his school work, but his lessons gave him very little difficulty and all his spare time was devoted to exploring the woods and fields with their myriads of new and interesting things to see and hear, to taste and smell, and about which to ask questions and to form theories. All these things left their indelible impress on his plastic mind. Let me quote from an unpublished manuscript some of his recollections of this period in his development:

"Every fine morning in spring I was away at daybreak through dewy fields and woods, listening to a hundred bird voices and watching the birds and squirrels. Then after about four hours spent in the woods, back to breakfast and school. Holidays were passed in

fishing on an old, partly submerged log on the treacherous floating brink of Muddy Pond, snaring little pickerel in the brook, catching butterflies or gathering birds' nests, minerals or wild flowers. In autumn came nutting, setting snares, and, in time, that pastime of all young savages — hunting."

At first, as with most youngsters, savage or civilized, his weapons were sticks and stones. That he early developed a keen markmanship is evidenced by another anecdote of his childhood in Quincy, before his family had removed to West Roxbury. One day as Edward was quietly at play, he was suddenly set upon by two older boys, "muckers" from the town. In an outburst of indignation at the unprovoked attack, Edward picked up the nearest weapon of defense, a half a brick, and threatened the urchins, who retreated a bit, then renewed their attack. As they advanced the second time, Edward in self-defense "hove the brick" as he afterwards expressed it, with such unerring if unexpected accuracy, that he hit one of his persecutors squarely on top of the head, and the assailant, toppling over backwards, disappeared into a gaping cellar-hole and was hidden from the view of the horror-stricken Edward, who rushed wildly home and shut himself in a closet for the rest of the day, momentarily expecting the dread appearance of an officer of the law, come to arrest him for the "murder" of the other boy. Though the urchin recovered promptly, none the worse for the adventure, it was a long time before Edward overcame his fear and remorse, and the remembrance of that day was still painfully vivid even after a lapse of more than sixty years.

After the sticks and stones, the next hunting weapons were home-made bows and arrows and slingshots. Like the born woodsman, he learned to distinguish many trees or plants by their fitness for his needs, long before he knew their scientific or even their common local names. As he roamed the woods he was ever on the watch for slender shoots of osier or viburnum for his arrows, for straight shafts of barberry or for hemlock or apple boughs for his bows, while many a garden lilac failed to bloom because its symmetrically forked twigs supplied such excellent crotches for his sling shots. Then there followed the fun of whittling and trimming and shaping and testing the weapons. How much the boys of today miss with their easily purchased, factory-made equipment for sport! Only those of us who have made our own armament can know the thrill which is lost in the present-day method of shopping by telephone or mail order. And though the home-made tools may be crude, greater craft is needed in stalking one's game and one must of necessity become an expert in still hunting and in woodcraft.

Following the bows and arrows, came a more civilized though perhaps no more efficient weapon, an old rusty horse pistol without a hammer, which was primed with powder and touched off with a match. As he said of it "it was more dangerous indeed to the hunter than to the game, but this only added to the excitement of the sport." Next arose a desire for a more deadly and far-reaching weapon than the horse pistol. Such a tool was found in the possession of a neighbor's boy. "Seventy-five cents changed hands, and now I was the proud possessor of an old Belgian muzzle-loading, smooth-bore musket, with a loosened, sawed-off barrel, a steel ramrod, and a broken lock. Boyish ingenuity was

brought to bear in fastening on the barrel with wire and in repairing the lock. Then for many moons that crude weapon wrought havoc among the furred and feathered denizens of the woods and fields, while under the midnight oil the collection of skins and mounted specimens grew apace."

With the development of his armament, his powers of observation became more keen and many of the impressions of those early days remained vividly with him throughout his years. One of these early impressions he has described as follows.

"How alluring the prospect of the verdant coppice seen from Muddy Pond (now Bellevue) Hill. Shall I ever forget my initiation into those shades and my first sight of the Ruffed Grouse, and that sound of thundering wing-beats as it first broke upon my youthful ears in the still woods? Even now there comes the recollection of the quick start and sudden heart-throb, which checked in an instant my headlong pursuit of a little gray rabbit, as from the dead leaves almost beneath my feet there sprang a great bird with loudly whirring pinions, that sped away in arrowy flight, through bending leaves and snapping twigs, disappearing in an instant in the thick of the coppice. There I stood breathless, with distended eyes, staring after this new wonder, while poor little Molly Cottontail made good her escape."

About this time the boy's family moved to Worcester and another, wider world opened out before the growing boy's aroused interest. Soon every field and wood, every lake and stream about the city was explored, and under the stimulus of the local Natural History Society, he began to make collections of interesting objects. Almost every boy passes through this "collecting" stage at some time during his development, but with most of them it is only a passing fancy, to be laid aside as the dust begins to gather on the poor "specimens." But with young Edward Forbush it served to crystallize his interests and to do much toward shaping his life work.

From this time on, his days, aside from his school work and helping about his home, were occupied in preparation for his life work. He developed an omnivorous appetite for all books on outdoor subjects. Stories of hunting, fishing and exploration, books on birds, animals and insects, were followed, as the limited resources of the local library became exhausted, by works on geology and on natural philosophy. Drawing animals and birds became a passion with him and this was followed by an endeavor to express himself and his love of nature by attempts at modeling and sculpture.

He had already taken up taxidermy and begun to mount birds and small animals. His first attempts were characteristic of his methods of working and his independence, as described in his own words:

"At the age of fourteen I took up taxidermy. One day, while we were still living in West Roxbury, a wandering Bluebird in search of a nesting place had found an opening in a rain-water conductor, which led to a full hogshead where the poor bird was found drowned. Later, stuffed by an ancient hermit, a work of nature and art combined, this specimen became the wonder and delight of the juveniles of our household. One evening some years later, however, in Worcester, little sister unwittingly placed a kerosene lamp

in such unfortunate juxtaposition to our treasure that its tail dissolved into fragrant (?) incense, and great were the lamentations thereat. The ruin of our only stuffed specimen fired me with an ambition to make a collection of mounted birds. Here was a golden opportunity for the acquirement of useful and practical knowledge. The stuffed bird and its rustic perch were carefully dissected, a book on taxidermy was obtained from the library, and the mystery of bird stuffing was solved. A Song Sparrow which had lost its life was the first specimen. Slowly divested of its little skin its stuffed presentiment appeared at last standing on its two legs on a bit of board with the head on one corner of the body and the tail on another. Soon a Bluebird was mounted, then a Goldfinch. At the early age of fifteen I came to believe myself a hunter-naturalist, but even at that early age the excitement of the chase was sometimes followed by reaction and remorse at the death of the lovely creatures slain, as I fondly believed, in the interest of science."

In those days there were very few books on natural history which would appeal to the average boy of today. Gilbert White's "Natural History of Selborne," Audubon's and Wilson's works on American birds, and Thoreau's essays stood almost alone, although John Burroughs was beginning to become known as a writer on outdoor subjects. Persons interested in natural history were expected to study, principally, dead creatures in the shape of "skins," mounted specimens, skeletons, alcoholic "pickles," pinned insects, and empty shells. To name, classify and label such inanimate objects seemed to be the chief aim and end of natural science. Very little time was spent in studying the life and habits of wild creatures in the field, for fear that they might get away if one waited too long before killing and "collecting" them for specimens. To quote Mr. Forbush: "Some of the material used by students was very dead, having been so fifty years or more. Such mummies have their uses, but later I came to see that life, not death, would solve all riddles; that an examination of the dead was merely a preliminary to the study of the living, and that it was more essential to preserve the living than the dead."

Not only was he self-taught in taxidermy but in many other things. A characteristic glimpse is the following account of his first essays in swimming.

"I was never taught to swim, although the family occasionally 'went in bathing' in shallow water, and clawed about on the bottom; but at the age of twelve years I knew less about swimming than a clam. My parents would not permit me to go in with other boys, because of my ignorance of the natatorial art, so there was no chance for me to learn. Although inclined to obedience by early training, I determined that the condition was intolerable, and that I would learn to swim or die in the attempt. Securing a treatise on swimming and practising the breast stroke day after day while lying across a chair or stool, until it became mechanical, I finally went alone to the lake. There I found a birch tree that had fallen from a steep bank into very deep water. Its trunk rested on the shore, while its top was considerably under water. My plan was to swim out and around the tree, in the hope that if the task proved too much, and the lake swallowed me up, the shore might still be reached by grasping the branches of the tree under water and crawling out upon it to the bank. With some misgivings I dove in, and swam with

might and main out into forty feet of water and back around that tree. This took all my strength and breath, but from that day I was a swimmer, and could go in with the other boys. I learned to take care of myself and another in the water, and in later years had opportunities to save four lives that might have been lost but for my confidence in my own unaided skill and strength."

Soon after the family moved to Worcester, Edward became a member of the Worcester Natural History Society, and he very soon became active in its meetings and classes. So outstanding was his interest in birds and his knowledge of them, that at the age of sixteen years he was appointed as Curator of Ornithology in its museum. He quickly found himself very fully occupied with the care of the scientific collection, with the preparation of specimens, with the organization of various classes in natural history, with lectures, and with writing for the local papers articles on the natural history of the region. Shortly before this he had left school, partly that he might help in his father's business, and partly because he had developed some original theories about educational methods which did not agree with the methods in common use at that time.

In this era of progressive education, project methods, vocational guidance, and intelligence tests, it is rather difficult to realize that only a few years ago practically all teaching was by the purely academic, all-textbook method, and that the system commonly practised consisted of trying to crowd into every child's head a miscellaneous collection of dry facts, most of which were uninteresting and unrelated to anything with which the pupil had contact. With that far-seeing and straight-thinking power which characterized him throughout his life, young Edward Forbush saw the weakness of the old didactic methods, and rebelled.

"I came to believe," he wrote years later, "that in education practical manual and agricultural training involving the use of the hands and the study of the living world should at least accompany that of the text book and the dead world, so that children might become interested in both work and study and might develop their bodies, their observational faculties and their capacity for useful action while pursuing their academic studies.

"Why, I asked myself, should I follow the beaten path in education? I determined to forego a college training, to earn my own living, to be independent of all assistance and to train myself by experience, observation and reading.

"So, at the age of fifteen, I gave up school and except for a few months at a seminary and at evening schools never went to school again, but most of my evenings were spent in study and reading or in preparing or studying specimens, alone or with others who could teach me something. My vocations for the next seven years were those of a farmer, laborer and mechanic — my avocation the study of nature. Thus I grew up independent, self-supporting, developing body and mind, preparing myself for the work that I seemed best fitted to do."

As part of his self-imposed training, he began to write out, while actually in the field, copious notes of his observations and experiences in the woods and hills and on the lakes

and streams during his frequent excursions. Some of these early bits of descriptive material are preserved for us in a collection of newspaper clippings which he preserved, and others are to be found in old notebooks. The earliest of his writings to which we have had access, is in a clipping from the now defunct Worcester Spy, under the date of July 9, 1880, and was apparently the first of a series of articles dealing with the local birds month by month. It is entitled "Our Birds in July" and is an invitation to go to the woods and fields in search of our feathered neighbors. The last paragraph is worth quoting as showing that already young Edward Forbush realized the importance of birds to agriculture:

"After the noise of your passage has ceased, the birds will gather around, curious to discover its cause, and the fault will be your own if you do not use your eyes as intelligently as they do theirs. Listen for the slightest rustle in the leaves, watch for the swaying of a twig, for these slight signs reveal the presence of some modest songster whose delicate beauty surpasses that of the richest fabrics and whose graceful movements charm the fortunate observer who can find and see our birds at home. The first bird to attract attention will be the chestnut-sided warbler, with his pretty yellow cap and chestnut sides; and somewhere in these woods, you will not fail to see warbling vireos, wood pewees, blue yellow-backed warblers, redstarts, ovenbirds, and downy woodpeckers. By rare good fortune you may catch a glimpse of a rose-breasted grosbeak, or of a scarlet tanager, that brilliant king of the woods, whose bright crimson plumage instantly attracts your eye as he swings easily along through the topmost branches. Not alone in the woods but take a stroll in the meadows, with one who keeps his eyes and ears open, and learn the birds there. Meadowlarks; bobolinks; field, grass, yellow-winged and Savannah sparrows; cow blackbirds; and many others fly about you or spring up almost under your feet. Climb the stonewall and sit down under the orchard boughs and watch. Here we see orioles, kingbirds, cherry-birds, phœbes, golden-winged woodpeckers, chipping sparrows, cuckoos, bluebirds and the swift swallow, all active and full of business, hunting down and killing the caterpillar, destroying the curculios, and the new-laid eggs of the 'army worm' moth, carrying devastation into the ranks of the 'cutworm' moth, and proving themselves the best friend of the agriculturist by destroying the many insects injurious to vegetation. The birds of July are well worth our study, but they are on the wing, and several varieties are preparing to seek 'fresh fields and pastures new.' August will bring new acquaintances. A full knowledge of the birds of *this month* will better prepare us for their observation and study to be continued in our *next*."

In October of the same year he contributed an article on "The Decrease of the Birds" to the Worcester Gazette in which he stated:

"The sportsman is largely responsible for the diminution of the game birds, for there is still shelter and food for the partridge, quail and woodcock in the interior of the state, and for the ducks and geese on the coast. Yet with our game laws well enforced the gunners of this generation can still have excuse enough for the pleasant tramps during the short season when the law is 'off.'"

Under date of September 1, 1883, he wrote an article for the Worcester Spy entitled

"The English Sparrow" which is interesting in showing that at that time he was beginning to study seriously the economic status of our birds:

"The sparrow question has gained little attention as yet in Worcester county. The birds have not become so numerous here as to carry off 'two tons' of hay from one farm for nest-building purposes, as they are said to have done in Germany. Neither have they been known to carry off hundreds of bushels of corn or wheat as they did near Philadelphia in 1877. Yet these sturdy birds have been fast pushing their advanced guard far and wide. Now we believe there is not a village in this county where they are not to be found. In this city they have been increasing in numbers for several years, and now may be counted by thousands. It is generally known that these birds were imported by municipal governments and by individuals, because of their alleged destruction of the noxious insects which infest parks and orchards. Upon their introduction in some of our larger and more southern cities the beneficial effects of their presence were seen at once in the decrease of caterpillars, canker worms and other enemies of the trees and shrubbery. But soon murmurs were heard against the sparrows. In 1877 articles appeared in the leading agricultural and sporting papers, some condemning these birds, others upholding them. Since then there has been a constant 'sparrow war,' and all the leading ornithologists of the country have had their say for or against the *Pyrgita*. The culmination of the whole matter is that the defenders of the sparrows have been worsted, and laws have been enacted and amendments made allowing the destruction of the birds.

"The number of the sparrows now in and about Worcester, and their rapid annual increase, suggests the possibility that they may soon become an important factor in our economy for good or for evil. We hope within the next year to accumulate evidence which shall settle the question as to whether the sparrow is needed in this section. We ask then the following questions, which cover the chief points of interest in the relations between man and the sparrow:

1. What insects are they known to destroy?
2. What fruits, vegetables and blossoms do they destroy?
3. What grains do they destroy in the field?
4. Do they attack and drive away our native birds?

"We hope all who have any interest in the matter will communicate with the custodian of museum, No. 11 Foster Street, Worcester, Mass. We wish answers which will throw more or less light on the points indicated, and on anything else in regard to the sparrow question which may be of interest. The observations of farmers may be of much value and we hope to have some help from them."

Another article published in the Spy a little later, is typical of the writer in the keenness of observation and clearness of description which it exhibits, as well as in the humanitarian touch at the end:

"I sit here now on a moss-covered rock by Coal Mine Brook, gazing at a frog whose eyes and nose just appear above the still water of a little pool at my feet. I was looking down past the image of the trees, down and down past the fleecy clouds to the fair blue

sky so softly mirrored there, and listening almost unconsciously to the drumming of a partridge as it swelled and died away upon the ridge, when suddenly there was a ripple and this great bullfrog's head bobbed up with a glare of protruding gilded eyes, and there it remains fixed in the center of the beautiful picture. . . .

"Whir-r-r! What — why, the partridge! Where he came from I know not, but now right here by the wall at the foot of that big white birch that the boys have lately barked, stands a lordly old grouse, his raised ruffs with their dark metallic sheen glistening in the sunlight, as with crested head drawn back and carried high, with bright and banded tail held high and widely spread, he stands alert. He pauses, listens, now turns, throws forward his head, and steps along, raising his feet well up, moving over the inequalities of the ground with a gently undulating motion, his broad tail raised or lowered at will, his dark wild eye flashing on all around. Beautiful sight! But he has seen a movement of my finger, perhaps, or hears the rumble of an approaching carriage on the roadway. He proudly mounts the wall with scarcely perceptible movement of the wings, cranes his neck an instant and quietly slides out of sight on the other side.

"Only a partridge! You may see dozens hung by the neck or heels in butchers' stalls next fall; mere wrecks of things that were. But as for me, I would not exchange my one sight of that crested, full-winged bird, in all the glory of his nuptial plumage, moving alert upon his native heath, his proud spirit untamed and free, his frame instinct with vibrating electric life and undaunted vigor drawn from our rugged new England hills, for all the keen joy of the sportsman as the mangled, bleeding form falls to his deadly aim, or the delights of the epicure as he revels in the luscious tender flesh of the slaughtered birds as they lie garnished upon the groaning table."

Although he had acquired considerable skill in preparing specimens before his appointment as curator in the Worcester museum, he was not satisfied with his work. Mr. Charles J. Maynard was at that time one of the most active and skilful naturalists of the group of young men who made the Nuttall Ornithological Club, recently organized at Cambridge, a power in the ornithological world. To him young Edward went for further instruction and experience. On September 20, 1929, less than a month before his own passing, Mr. Maynard wrote me this letter regarding the association of more than fifty years before:

"In 1875 Mr. L. P. Forbush of Worcester, brought his son, Edward H., then a lad of eighteen, to me to receive instruction in taxidermy and ornithology. At that time I had a large supply of bird skins and nests and eggs for which I was constantly receiving orders from educational institutions and private individuals. Birds and other animals were constantly being sent in to be mounted or otherwise prepared as museum specimens. Some collecting was also being done.

"The young man was very enthusiastic and proved to be an apt pupil, soon becoming familiar with the material which I had in stock, and was thus very helpful in filling the orders which came in. He also learned to prepare specimens well and rapidly, not only making up bird skins after a method which I had invented, with skill and neatness, but

also learning to mount other animals. A snapping turtle which I still have, is an excellent example of his work.

"In short, he became so proficient, that when I went south in charge of the Parker Maynard Research Expedition, in the fall of 1876, I left him in charge of my business and he proved a very efficient manager."

During the year which he spent working with Mr. Maynard, he was so unfortunate as to develop a severe rheumatic affection, from wading in deep cold water in early spring, exploring the marshes of the Charles River in search of specimens. No treatment seemed to relieve the trouble, and a friend advised a winter in the South. The opportunity came through a neighbor who was accustomed to spend his winters in Florida in search of health and who attempted to organize a camping and boating party for southern Florida. When the day for starting arrived, however, only one beside Mr. Forbush was ready for the adventure. The trip proved of great interest and value to Mr. Forbush, for Florida was an almost unsullied wilderness for the naturalist at that time. But let Mr. Forbush relate some of his experiences in his own words.

"We had read Ober's 'Three Months in Florida for One Hundred Dollars' and believed that what he had done we could do. The plan was to cruise to Florida on a schooner, go up the St. Johns on a steamer, and, as there were no steamboats beyond, buy a boat and do our own sailing on Indian River and other inland waterways.

"When we arrived at New York the first week in January in exceedingly cold weather, the schooner on which we had engaged passage was frozen in, and we boarded the steamer Western Texas for Jacksonville. She was built for river work and this was her second trip outside. She ran into a great storm off Hatteras, the steering gear was broken by the mighty seas, and she lay in the trough of the sea for four hours. Then, the crew having rigged some sort of steering apparatus, she was headed back for New York, but the storm abated and she made Jacksonville in five days. The less said about this experience the better.

"On the voyage we made the acquaintance of two young men of abundant leisure, from New York and Baltimore, who were going to Florida for the winter, and they joined our party. When we reached Jacksonville the thermometer registered seventy degrees, which seemed like summer.

"We took the first boat up the St. Johns River, and from there during the journey to southern Florida we saw what no man ever will see again. Along the upper St. Johns and the Oclawaha the Florida wilderness came down to the river banks and enroached upon and even overhung the stream. In many places on the Oclawaha the semi-tropical foliage with its drapery of Spanish moss entirely overarched the water, so that a steamboat plowing its way along the river, seemed to float in a tunnel of luxuriant verdure. Alligators in numbers swam in streams and ponds or rested on the shores. Uncounted swarms of waterfowl of many species inhabited the waters in innumerable multitudes. Great flocks of White Egrets and ibises, among them the lovely Roseate Spoonbills, possessed the land. Every turn in the river brought into view a new scene, to be scanned for novel

forms of interesting life. When we arrived at Lake George, wild ducks were scattered over the lake as far as the eye could see or the glass could make them out; and when, later, we reached Indian River Lesser Scaup Ducks or Bluebills floated upon the water in vast dense flocks, a mile or more in length. Shore birds were seen in multitudes along the coasts and lagoons. Eagles, hawks and owls were common. Wild Turkeys and deer were plentiful and the tracks of bears, panthers and wildcats could be seen on the sands.

"Practically all tourists were armed with rifles, shotguns, revolvers, or all three. These armed men lined the rails of the steamboats and shot *ad libitum* at alligators, waterfowl or anything that made an attractive target. There were practically no restrictions on shooting, although the steamers never stopped to gather in the game, but left it to lie where it fell.

"About thirty species of fish were recognized in Indian River, and mullet were so plentiful that they not infrequently jumped into boats, rowed on the river at night. Here, then, was a hunters' and anglers' winter paradise, with a never-failing supply of firewood, where no one need starve or freeze. Southern Florida, in those days, much resembled the Florida of Audubon's time, but northerners as well as natives had settled along the rivers. Oranges were so plentiful in the groves that the people offered strangers all the ripe fruit they could find under the trees. Whenever we stopped near an orange grove we filled a mealbag with the ripe luscious fruit.

"Our first introduction to the mode of life of the natives came when we left Lake George in the interior for the coast region. Early in the morning, having disembarked from the steamer, we found a place to get breakfast and there heard of a mule team which could be hired for a trip across the country. . . . The canoe and all our luggage were loaded, the colored driver clucked to his mules and we were off for a trip forty miles across the country for Port Orange and Daytona on the Halifax River.

"The road ran through sand and swamp. The swamp roads were corduroy or log-built and riding on a springless wagon on such roads was unpleasant to say the least. I tramped the whole distance gun on shoulder, exploring the wilderness of swamp and forest on the way. Every mile brought some surprise, sparrows, Bluebirds, warblers, Mockingbirds, Florida Jays, Brown-headed Nuthatches, Red-bellied Woodpeckers, Logcocks and other birds occupied my attention. Squirrels, raccoons, alligators and rabbits all served to give spice and variety to the stroll.

"Toward night, having made about twenty miles, we stopped at a native log cabin where a prominent citizen, a selectman of the township, resided with his family. The residence was in a clearing in the open 'piney woods.' It had but one room and a floored loft under the roof. The logs were not chinked and one could pass a finger out between them almost anywhere. There was no provision made in this cabin for a fire, but a small log cook house, where all the cooking was done, stood near by. This little shack was provided with a chimney, situated at one end, which was made of sticks laid cobhouse fashion, plastered with mud. It projected only a few feet above the ridgepole. It was expanded at the bottom to form an open fireplace. The owner of the property, an

elderly gentleman, hospitably agreed to put us all up for the night, and in payment therefor took an old cheap revolver for which we had no cartridges.

"Preparations for the evening meal were begun immediately. One of the boys was sent out to a dead 'lightwood' tree that lay on the edge of the clearing to chop off some limb-wood and splinters for the fire; another was dispatched for yams; the father went for some dried venison. The mother mixed an unleavened corncake which was cooked in an iron 'dutch oven' out of doors by a girl, who built a bright fire on top and a little one underneath. The yams were boiled and our bountiful repast now being ready, we all sat down at the table. The salt deer meat was of the consistency of old boots. Such viands might encourage Fletcherism, but this appeared to have been seasoned with a mixture of sand and salt, half and half. The 'hoecake' was good, and not very gritty, but the sweet potatoes were excellent, great, soft, sweet, luscious yams such as the younger members of our party had never tasted before. We swept the board clean.

"The night was cool, even frosty, and when the meal was ended we all adjourned to the cook-house fire, our party meanwhile wondering where we were to sleep. Soon the girls disappeared, and from various subdued sounds heard later, we surmised that they had retired behind some skins hung in a corner of the cabin. Then the boys crawled through a hole in the floor leading up into the loft, and our host suggested that we four might have the bed. Think of it! Four good-sized men and one bed! We drew lots for places, and I drew the outside, next to the inch-wide cracks between the logs, with the north wind blowing freely in. My rest was somewhat broken by turning over to warm one side after the other against my next neighbor who, it seems, did not suffer from the cold. Our host and hostess made up a bed on the floor and the negro, wrapped in his blankets, slept on the wagon, protected by a canvas cover thrown over it to keep off dew and rain.

"In the morning a white frost covered everything. We concluded to go farther south as soon as possible and after a light meal started for Port Orange, where we arrived before dark. At that time Port Orange and Daytona were two villages of a few shacks, each fronting on the Halifax River. Their only attractions seemed to be a fine sandy beach and an abundant supply of dogs and fleas. Verily since then time has worked wondrous changes.

"Here we camped, and bought for a song a big old flatboat or lighter and a small skiff with sail and centerboard. When we launched the flatboat, we soon learned why it was for sale cheap as it leaked 'like a sieve' but with a little lumber, some calking, a tar pot, the help of all hands and my knowledge of wood working we soon had her 'tight as a drum,' built a large cabin on her, fitted her with two masts, sails and rigging, named her rightly Hard-tack and were ready for our venture into the unknown. . . .

"The next morning at daybreak Joe took my rifle and started off to the eastward. I took my shotgun and a few buckshot cartridges, with some ordinary bird charges also, and headed northwest for the head waters of the St. Johns River. George remained with his shotgun to keep the camp. Each had matches and salt and each was independent for the day, all expecting to be in camp that night.'

"A tramp of a mile brought me out of the piney woods into a country where woods and prairies, sawgrass ponds and savannas alternated, more or less, along the way. The loud raucous notes of the great Sandhill Crane resounded here and there, and, as I had seen no deer, and had been told that the cranes were good to eat, there was a crane hunt on at once. The tall birds were keen, wary and hard to come up with. I ducked low in the prairie grass, crawled, sneaked, lay flat at times in shallow water and used all the strategisms of the hunter for more than an hour, shooting all my buckshot and bringing down only two birds. I skinned the better of the two, saving the skin for a specimen, wrapped up the carcass in a paper, placed skin and body in the pocket of my hunting coat, slung the other bird over my shoulder and kept on. Then, having fired all my buckshot, I began to start deer. They sprang from the long grass at my feet, stood and gazed or bounded away until twenty-one had been counted; but as bird-shot would only wound them needlessly, I let the pretty creatures go unharmed. Bob-whites rose from cover here and there. Snipe jumped from the swales. A Barred Owl complained from a cabbage hammock. All these were added to our prospective larder.

"Deer trails were everywhere, like cow-paths in a bush pasture, and sometimes I followed them, if they led me in the right direction. Coming to a wide wet savanna, I took off my shoes and stockings and followed a deer path through the water. Where the water was about four inches deep, something like a big fish ran from behind me between my feet, hitting both ankles with its wriggling body as it went. After it had passed I saw that it was a large, poisonous moccasin snake, and the charge from my shotgun tore it in two. Even then the serpent tried to bite and the sight of those powerful, striking fangs was one not soon forgotten. After that incident shoes and stockings were put on, and not removed during the day. Both water snakes and moccasins were plentiful in the swamps here and elsewhere, but we did not see or hear a rattlesnake.

"On and on I went, through prairie, forest and marsh, until the high noon sun found me at a little stream that one could step across, which was believed to be a source of the St. Johns River. Here I rested, built a fire in a hole in the ground, in which I roasted the birds, wrapped in wet leaves or mud, as I remember it now. The Bob-white and snipe were savory and good, but I cannot from the experience of that day, recommend baked owl.

"On the way back to camp I secured a fine eagle, was followed by a panther, was nearly headed off from the river by a forest fire, and finally reached camp long after dark, George shooting to guide me back. Following the sound, I reached the snug camp in the little gulch; and ten o'clock found us warm, dry and comfortable, relating the experiences of the day beside the camp-fire. We were not destined to sleep until later that night, for two great Barred Owls had made that fire their rendezvous, and they made night hideous with hoo-hoo-hooaws and other owl endearments. Never before had we noted such a noisy pair of lovers, but as the fire died down they drifted away and after that we heard no sound until a great black Logcock beat a tattoo on a leaning pine at daybreak. Several days we hunted with more or less success but everything mundane must have an end, and so a week later we set out for the main camp. . . .

"In those days there was a plague of fleas in Florida. The dog continually brought them into camp. Therefore I learned to 'sleep out.' My bed was made nightly on a different part of the Indian River beach, anywhere within half a mile of the camp. Here a bath in the salt water freed me from my tormentors, and a woolen blanket and two rubber blankets were my camp. What if it rained? Well, it just rained.

"Morning after morning at daybreak there were strange sights and sounds on earth and in the air. Great herons waded in the tide. Weird pelicans sailed in orderly procession; now and then a lone one, diving to catch fish, seemed to turn a complete but awkward somersault. Here the eagle chased the osprey and robbed her of her finny prey, diving out of the sky like a thunder-bolt and snatching the fish ere it struck the water. Always I slept with a loaded gun at hand, for with a fair wind the ducks drifted inshore in the night, and now and then there was an opportunity to pick up a brace or more at daybreak.

"One warm morning, before sunrise, my eyes opened to behold four or five Bluebills, only a few yards away and utterly regardless of my presence. It came to my mind that in 'The Young Voyagers' Capt. Mayne Reid told of an Indian who waded into the water, his head and shoulders covered by a stuffed swan skin, and pulled ducks under water by seizing their feet. Waiting until all the birds had dived, I slipped out of my blankets, entered the water quietly and swam under the surface to the point where the birds had disappeared. I could not see them in the water, but came up within four feet of the two nearest. Before my fingers could grasp them they stood up on their tails, their yellow eyes glaring in horror, as they backed away. They seemed a little dazed and slow for a moment, but they were too quick for me, and when once they got out of reach they never stopped going, as far as I could see. . . .

"The rest of the journey was a long picnic. One night we rowed far into the night through a great swamp before we could find a camping place. Often we were obliged to drink river water so thick and discolored that one could not see the bottom of the cup; but these were minor matters. And then one day we discovered the big 'gator.'

"We all have read of great saurians whose fossil remains have been found in the earth or rocks, and have seen pictures of the monsters restored; but George and I did not believe that there were such gigantic creatures in our time until at last our eyes beheld one. The night preceding this occurrence we had camped in the great swamp on an Indian shell mound. We found another party encamped there who told about a sixteen-foot 'gator' which had been killed not far down the river. We had doubted whether there ever was so big an alligator, and were all agog to see it; so the next day we scanned the banks carefully.

"Suddenly I exclaimed, 'That must be the very fellow!' There on the high bank, fully a quarter of a mile away, lay a tremendous reptile. With a fair wind I sent the boat down toward it. George looked it over with the glass, exclaiming with amazement at its size, but was sure it was alive. One fore leg was doubled backward, which seemed to indicate death; but George was so sure the creature was alive that he put two buckshot

charges in his gun, and prepared to attack. It was arranged that he should go forward to the mast, fire when I gave the word and then drop to avoid the boom, as I was to bring the boat about and off on the other tack, to keep clear of the animal should it plunge into the river.

"As we came nearer, and it became evident that the creature was asleep, its enormous size grew upon me. We had seen 'gators' nearly twelve feet in length, and measured them, but never one in the remotest degree approaching the length and girth of this one. All we had seen would look like pygmies beside it. The tail lay up back over the inequalities of the bank, and recalled to my mind pictures seen in boyhood of the great curving wall of China receding over the hills into the distance. George was greatly excited, and kept turning to me and whispering 'Shall I fire?' while I kept shaking my head. I wanted to make sure of this world wonder, and knew that nothing would stop it but a shot at point blank range. The whole thing seemed like some wildly improbable dream. As the boat approached within a few feet of the bank I called to George to fire.

"The blaze flashed out of both barrels, George dropped, and the boat spun round like a top. Where those charges went we never knew, whether they hit earth or sky, but they awoke that 'gator.' It sprang up and forward until from my lower position in the boat I could see the sky under its belly. Then it turned and lunged straight for our little craft. The bow had swung just in time. Had the monster descended on it he would have crushed it under water. As it was, he came near swamping us. George gazed at me in blank amazement. I have always believed that when he shot he shut both eyes and pulled both triggers, and never touched even the scenery. We never saw the big 'gator' again, nor have I ever anywhere seen another that could in the least compare with it for size.

"So we drifted on. Spring was in the air. The Mourning Doves cooed in the clearings, the Mockingbird and the Cardinal were in song. The great vernal flight of birds began to come in from the gulf and swarm into the woods. At night the Screech Owl wailed and the Chuckwill's-widow called weirdly in the glades. In the swamps baby alligators swam and crawled about, lizards ran nimbly to and fro. Egrets spread their snowy plumes in graceful postures, showing off to their waiting mates; and, as the tide of returning life moved northward, we reached Jacksonville. The invalid had recovered. Strong, well-tanned and ruddy, we embarked for our northern homes."

While the other members of his party were in Florida either for their health or in pursuit of "sport," which in those days was almost synonymous with "slaughter," Mr. Forbush was primarily a naturalist, and everything which he shot was either used as food or preserved as a specimen. Many of his carefully prepared skins went to the Worcester Natural History Society or to other museums, and he sold many specimens to private collectors. Soon after his return to Worcester he associated himself with Mr. William S. Perry of that place in organizing The Naturalists' Exchange, a sort of clearing house for all kinds of natural history specimens and for collectors' and taxidermists' supplies. A little later, however, he sold out his share of this business to Mr. C. A. Reed and became Vice

President and later President, of the Worcester Natural History Society, and Curator of its collections. Under his enthusiastic leadership the society was a very active and useful organization, sponsoring many lectures, conducting classes in widely varied subjects, and adding much to the educational resources of the community. He took an active interest in enlarging and improving the collections of natural history objects, and the museum acquired high ranking among institutions of its type in this country. He became a Life Member and continued to maintain a deep interest in the work of this society until the time of his death.

The next few years were rather uneventful from the point of view of the naturalist and collector, for, while he continued to make collecting trips, they were short ones and in less exciting regions than was his trip to Florida. They were important years in his personal life, however. On June 28, 1882, Mr. Forbush married Miss Etta L. Hill, of Upton, Massachusetts. Four children were the result of this union, and all, with their mother, survived Mr. Forbush. The oldest son, Erwin Hill Forbush, was for some time secretary of the Federal Land Bank in Springfield, Massachusetts, and he lives, with his wife and three children, in the nearby town of Longmeadow. The other children of Mr. and Mrs. Forbush were two daughters, Myrtice Elizabeth, now Mrs. Chauncy Allan Lyford of East Aurora, New York, and Etta Lorenda, who is the wife of Ralph W. Marshall of Hyde Park, Massachusetts, and a younger son, Lewis Edward Forbush.

In 1885 the Natural History Society organized a summer camp for nature study, as part of its educational program, and a little later Mr. Forbush was made its managing director. This camp, which was located at Wigwam Point on the shores of Lake Quinsigamond on the outskirts of Worcester, was a pioneer in the great summer camp movement which today is doing so much towards building up physically, mentally and morally the young people of America. This camp, which was unique in many ways, quickly established itself in popularity and it soon reached an annual enrolment of nearly two hundred boys, with an auxiliary camp of about forty girls which was located across the lake from the boys' camp.

Mr. Forbush outlined the plan of the natural history camp in a short article which he wrote for Forest and Stream of May 16, 1889, as follows:

"The boy's summer vacation is generally given up to comparative idleness or to purposeless, ill-directed activity. The plan and scope then of this summer camp are to place before the boy a great variety of useful occupations, physical exercises, studies and recreations, and then to direct his energies without burdening him with irritating discipline or restrictions. Each boy is allowed to follow his own peculiar bent. Is he a born mechanic, there is the workshop stocked with tools and simple machines, where he can build boats, traps, camp furniture, etc., with the advantage of having skilled mechanics to assist him; or he may spend hours in watching the boat building and other occupations. Does his youthful mind aspire to excel as a hunter, trapper or angler, then he will follow the steps of the camp hunter, watch the making and setting of traps, the building of log camps, the netting of bait and the tying of flies; he will learn the use of the woodsman's

ax and the handling of boats and canoes; he will learn the secrets of woodcraft or frequent the shooting grounds. Should he have the instincts of a naturalist, he will follow the ornithologist in his search for birds, the entomologist in his excursions after bugs, beetles and many-legged things, the botanist who gathers wildflowers, or the geologist among the rocks; he may spend hours with the taxidermist, learning the art of preparing and mounting specimens, or in the laboratory or by the shore, he may watch curious forms under the microscope. Should his taste be artistic, he will join the roaming class in outdoor sketching. Should his inclinations favor the military, he will have an opportunity to exercise them by a daily drill with the cadets, and if he proves efficient he may become an officer. There are gymnastic exercises and swimming lessons. . . . Caution is taught when in and upon the water, and as every safeguard is put around both those who are experienced and those who are not, there has never been an accident. Many means of recreation are provided. Games and sports are freely encouraged. Entertainments are given in the pavilion. Illuminations or fireworks occasionally fill out the evenings, and on special occasions, gathered around the camp-fire, the veteran hunter, ornithologist, woodsman, soldier and forester, will tell tales of adventure in the wilderness, on the prairie, mountain or shore, which will linger in the memory for years."

That the camp was unique in many ways, and was a pioneer in educational methods and in management, was clearly shown in an article which appeared in the Boston Traveler, dated July 31, 1890. It began:

"Within thirty rods of the very centre of this Commonwealth is an object of more or less curiosity. It is the Worcester Natural History Camp. The reader will naturally inquire why this, more than any other tented field, should be an attraction or of any special interest. The answer is easy enough. It is the only encampment of this kind within the broad confines of Uncle Sam's domains.

"Funny, isn't it?

"Well, yes, in a certain sense, but when considered in all its details, its advantages and its superiority over everything in its class, in point of combining pleasure with profit, learning in its different branches, with recreation, the camp becomes at once more of a study than might be at first supposed. . . .

"The camp could hardly fail to be a popular resort in the hands of so genial and kindly a gentleman as the president, Mr. E. H. Forbush."

Mr. Forbush made another collecting trip to Florida in 1886, and made numerous shorter trips in the eastern states. In October, 1887, he became an Associate Member of the American Ornithologists' Union and a few years later he was elected a Member of that organization. In 1912 his standing as an authority on economic ornithology and his work for conservation were recognized by his election as a Fellow of the Union, a distinction which is granted to but few of the outstanding ornithologists of the United States and Canada. At the time of his death he was also a member of the Advisory Council of the Union.

In the summer of 1888 Mr. Forbush made another extended collecting trip, this time

to the Pacific coast. It was his intention to visit Alaska and the Pribilof Islands. On the trip across the continent he spent some time in Manitoba, Saskatchewan and Alberta, and also visited Washington Territory, collecting specimens of natural history as he went. He planned to take one of the few steamers which ran from Whatcom, Washington, to Alaska, but when he reached that point he found to his dismay that the steamer had already departed and that he must make other plans. Learning that a United States Coast Survey vessel was at work among the little-known islands along the coast of Washington and British Columbia, he made arrangements to use this vessel as his headquarters while collecting. Here he found conditions very different from anything he had encountered on the Atlantic coast, and he had several quite thrilling adventures.

It was while engaged in this work that he had the interesting experience which he later described in a series of articles for Forest and Stream (1889), entitled "Five Days a Savage." He had planned to make a visit to a group of small sandstone islands in the San Juan Archipelago which were known to be rich in fossils, as well as in bird-life. He procured a small skiff with mast and spritsail, which he steered with an oar. His collecting materials were stored in a large water-tight zinc-lined box and included guns and ammunition, a set of taxidermist's tools, insect nets, a geologist's hammer and chisel, etc., and a rope about two hundred feet long, for use in cliff-climbing. His other equipment included a roll of blankets, a small tent, a change of clothing, rubber blankets and rubber boots. He took neither supplies nor cooking utensils, as he expected to carry sufficient cooked food to last three or four days, with such slight additions as might result from his hunting.

His boat having been towed to the chosen location, he spent an arduous day in climbing the cliffs and chiseling out from the sandstone, specimens of fossil shell for his collection. It was then time for his friends of the Coast Survey to return to their base. As they were about to weigh anchor it was discovered that the steward had neglected to prepare the food supplies which he had counted upon taking with him, but nothing daunted, Mr. Forbush decided to make the best of it and to "live on the country" for a few days, until the steamer returned on its next trip. He knew that there was water on some of the islands, that there were clams, mussels, ducks and shore birds, sea birds' eggs and edible roots, all of which the Indians used for food, and he was not afraid of fasting for a few days if it became necessary. Taking the remains of the noon lunch, he said good-by to his friends, and sailing to one of the islands, made his first night's camp at the head of a little bay.

The next morning he shot some water-fowl for breakfast, roasting them over the embers after saving their skins for specimens, but being obliged to eat them unsalted. As the tide ebbed, he speared some great crabs with an extemporized spear and dug some clams with a pointed stick. Later that day he obtained some salt from a squaw-man's cabin, but no other food. His next morning's breakfast he describes as follows:

"Having now some birds and a healthy appetite, I dug a few clams, built a driftwood

fire, scraped some large mussels off the rocks, and laid all the shellfish on the coals to roast. As the shells opened I took the clams and mussels out with my knife blade, trying them at all stages, well done or rare, and was surprised to find that when the 'mantles' were removed the mussels were rather superior in flavor and quality to the clams. Already the Siwash had begun to rise in my estimation, for mussels are said to be a favorite dish with him. Mussels, crabs and bay snipe made me quite a respectable meal."

That day he spent collecting on the Skipjack Islands, mere rocky ledges surrounded by racing tides. Here he found interesting colonies of water-fowl.

"On near approach to this nursery of sea birds a pandemonium of sounds greeted my ears. The wild, plaintive cries of the great Glaucous-winged Gulls mingled with the loud plaint of oystercatchers, the quacking of Harlequin Ducks and grumbling or hoarse growling of puffins. Gulls were perched everywhere on angles and shelves of the rock, or circling about overhead. Puffins, guillemots and oystercatchers sat on the reefs, and behind the projections of the rocks a few cormorants sat erect on the very verge of the sea wall.

"As the boat drew nearer, the mass of ducks rose in a body with a noise like thunder, and skimmed away to leeward, followed by a flight of puffins and other birds, while the gulls rose high in air, and crying louder and louder, circled overhead. Then the cawing of crows joined the din as they came from far and near from other islands to the feast of eggs and young exposed by the fleeing sea birds. . . .

"Now the Tufted Puffins began to return by ones and twos in rapid flight. A curious sight they were, with their great red 'noses,' their creamy crests streaming, their red splay feet spread wide out on either side trailing behind, and their little wings 'working for two.' . . .

"The noon hour had passed, and it was time to lunch. In the cracks of the cliff I found a few eggs of the Pigeon Guillemot. Having first drunk all the water that remained in my pail, I blew the fresh eggs into this, and building a driftwood fire, scrambled the eggs in the bottom of the pail."

The next night was spent near a fisherman's cabin and breakfast was supplied by the squaw-man's wife. Seeing the dead cormorant which Mr. Forbush was skinning, she said it was "skookum" and he determined to try roast cormorant at the first opportunity, and occupied the morning hunting for birds.

"The dinner hour was now at hand, and it was time to try the cormorant. First some lacamos roots were dug, which somewhat resemble potatoes, and are used by the Indians for food. These were supplemented by wild onions and a sort of wild mustard that grew on top of the rock. The cormorant, which had been drawn when killed and later put to soak in salt water, was stuffed with wild onions and roasted over the coals. It seemed that more savory game had never passed my lips. The oystercatchers were excellent, and the lacamos was served as a side dish on a flat stone. With it all went the best possible sauce, hunger. Now came regrets that I had not roasted those young crows. . . .

"Now for the puffins' nests, which had been the chief object of my return. There were

numerous burrows made by these birds in the perpendicular face of the light soil that topped the edge of the cliff. Here I got a hitch with the rope over a projecting rock or stump, and rigged a 'boson's chair' to keep me from falling, then commenced to dig with a three-cornered scraper, brought along for this very purpose. Having followed a burrow for three or four feet, I inserted an arm to its full length, and drew out a bird, and then a white egg covered with red earth. This sort of thing continued for two or three hours. Talk about a dog digging out a woodchuck! There is no comparison. I chopped and tore out roots, dug out stones, went in head first until covered with red earth, got my hair, mouth and shoes full of it. . . . The digging continued until, following a hole for about eight feet, I found three or four branches or ramifications, and trying to trace these, burrowed into an old colony. This was a perfect labyrinth of interlocking tunnels, which seemed to honeycomb the bank in all directions. These tunnels went in so far that I desisted rather than risk being buried alive. . . .

"Having been strenuously engaged since three A.M., my appetite for breakfast was developing. There was some water left in the pail with which to make a bird stew, which when made was flavored with wild onion and mustard; and this, with a small fish speared with a hand-made wooden spear, and some roasted mussels, completed the morning meal. . . .

"Here on these outer ledges were more Black Oystercatchers, and here for the first time I found their remarkable nests, which, so far as I knew, never had been described. . . . Being unable to find an oystercatcher's nest elsewhere, and seeing that the birds haunted these ledges, I determined to land on one and go over it carefully. I succeeded in landing safely and paying out line, let the boat float well clear of the rock while exploring it. Immediately an oystercatcher rose from the highest point of the ledge, and there in a hollow between two ridges, which were practically invisible until one was actually on the rock, was a remarkable nest. There was a round, saucer-shaped depression, more than six inches in diameter, which had been hollowed by the elements. This had been lined by the birds with small pebbles, such as become loosened from the rock by disintegration during the ages and roll down into the hollows. These had been laid from the center outward in almost perfect concentric circles, thus paving the saucer-shaped receptacle in which the dark, handsome eggs lay. They and the sitting bird were concealed from the passerby in part by the outline of the rock, and in part by the blending of their colors with that of the ledge. No more perfect instance of protective coloration could be found."

On the fifth day, while sailing across an eight-mile stretch of open water, he was overtaken by a hard windstorm and, caught by the changing tide, nearly met disaster. Finally, however, he reached the shelter of Lummi Island where the Coast Survey party was encamped, and at two o'clock in the morning found the steamer at its mooring and turned in, none the worse for his experiences.

A little later, while still collecting sea birds' eggs, he met with an adventure which few of us would care to duplicate. Let him describe it:

"Most of the islands that I visited on the coast of Washington and British Columbia were topped with scattering trees, and a few were wooded. In searching for birds' nests, my usual method of descending a cliff was to pass a rope around a tree trunk at the summit, throw the ends over, and go down holding both lines in my hands. On attempting sheer descents, I made one end of the rope fast, and let myself down hand over hand to some shelf.

"On the last island of the group, which was treeless, I could find no point of attachment for a line, and as there were clefts in which sea birds made their home, I determined to try a descent without a rope. To see how this might be done, I lay down at the edge, and examined that portion of the cliff which could be seen from my position. The rock sloped irregularly downward for about twenty feet, and then assumed the perpendicular. Along its visible portion there were occasional vertical fissures; also some horizontal and diagonal seams, with narrow projecting shelves which offered a precarious footing and handhold. Where the seams intersected the vertical fissures little caves were formed, and in these the birds were nesting. Some distance to my right was a cleft larger than the others. Projecting from it and overhanging the verge was a weather-beaten stump or snag, all that remained of a lone tree, which had once grown out of this miniature chasm. There the cliff overhung its base and was inaccessible from below.

"Choosing a diagonal shelf for a foothold, and descending by thrusting my fingers into such crevices as happened to be within reach, I gained the first deep, vertical cleft. Inserting my head, arms and shoulders within, I secured a set of guillemot's eggs, but could reach no more, for they were far back out of sight in the very bowels of the rock. The next shelf was hardly five inches wide. I carefully let myself down to it, and finding such handhold as presented itself, crept cautiously on. I had almost reached the large cleft when an unexpected horror happened. The surface of the rock must have been undergoing disintegration, for the whole shelf gave way bodily beneath my weight. My feet shot out and down so unexpectedly, and my body followed with so sudden an impetus, that my hands were torn away from the cleft which my fingers just reached to clutch. In sliding past the place where the shelf had been, I involuntarily turned in the air, throwing my body toward the cleft and reaching downward for the snag on which my whole mind now centered. My hunting coat caught on the cliff and was dragged up over my shoulders. This may have checked my fall a little, but the only noticeable effect at the time was that my field glass fell out of my pocket, and my knife dropped from its sheath. Half falling, half sliding down that steep and rugged slope toward that fearful verge, hurried toward certain destruction, I clutched at the snag in passing as a drowning man catches at a straw, reached it, and held on with a death grip. My whole soul went into that grip. The weeks of rowing, paddling, and cliff climbing that had hardened my muscles and strengthened my fingers served well their purpose. As my body, checked at arm's length, swung beneath the snag, it seemed as if the strain would tear my arms from their sockets. The snag bent and sank crackling downwards until it rested on the shelf at the bottom of the crevice. As I hung there and felt it give and splinter, the sound of rend-

ing wood sent a poignant shock through my every nerve. Still, all the time, I felt a thrill of delight that hanging there on the brink of eternity I was able to hold on and defy death as long as the cracking wood should hold. I heard the clink of the knife as it struck far below, and the surge of the breakers on the rocks. It is said that at such moments all the events of one's life pass through the mind. No such thoughts troubled me. My whole attention was now concentrated in holding on till the last breath, or until the straining wood should part. But at last the old snag settled until it rested on the solid rock. Its roots were firmly anchored. It held! I was now hanging over the very verge of the cliff, with my legs dangling below the overhang. There was no shelf for a foothold and it seemed that I must hang there until, strength failing, I fell into the abyss. But here my experience as a lone hunter came to my aid. There are many compensations for such a life, chief among which is the spirit of self-reliance which it implants. I cast no despairing glance over that sailless sea, nor wasted breath in useless shouts for help. My eye ran over the face of the rock, while my fingers worked nervously in the effort to raise my body nearer the cliff. A little to my right was a widening of a small crevice, which I managed to reach with my right foot by working up the snag with both hands and then raising both body and limbs. It was a nerve-wracking task, for at every movement the wood creaked and crackled, sending thrills of agonized apprehension through my being. Having gotten the toe of my right shoe well into the crevice, and my body against the rock, I hung panting for breath, hopeful, yet fearing every instant lest the splintered snag should part. Having rested, I was able to hold my body against the rock with my left hand and right foot, and, unclasping my right hand from the saving wood, reach another crevice still higher up. From my right foothold a diagonal cleft led up the sloping rock toward the summit, which I managed in time to reach by clinging tooth and nail everywhere. Here I threw myself down on the brink, bruised, strained, exhausted, but happy, feeling the joy of a man who, standing on the scaffold, is saved at the last moment by a reprieve."

One other adventure, which again tested the mettle of the man, and we leave the Pacific waters. We quote again:

"In August of the same year [1888] I started north from Cadbury Bay on Vancouver Island to explore the islands along the coast. . . . The canoe in which I set out on the journey, made by the Indians on Queen Charlotte Islands, was very small, being about ten feet long on the water line, with a long, high, overhanging prow, built to ride the seas. It was hollowed from a large log and made in two parts, the canoe proper and the prow, which was fastened firmly with wires and sinews to one end. It was bought from the Indians by a friend in Vancouver, who had some light, flat ribs put in to strengthen it, and also fitted it with rowlocks, as one man would have difficulty in handling it with a paddle at sea. Strong short oars, a mast and a rubber blanket that could be rigged as a spritsail by day and utilized as a shelter at night completed the propelling arrangements. . . .

"There was a great swell running in the channel, but the wind had died away. Taking in sail I shipped the oars and laid a course to cross the channel to an island five miles away. When half the distance had been passed the swell had increased in power and

looking away down the channel I saw that the wind was coming, and that a sail was scudding down the shore before it at a racing speed. This was an unwelcome sight, as it was a head wind for me, and already the sea was high. Soon the distant sail had more wind than she could handle, had dropped her peak and was running for a harbor. Looking away down the channel I saw a line of foaming seas, and heard the roaring of the gale coming out of a clear sky. It seemed that I must take it as it came, and try to ride it out, as there was no escape. So, heading the canoe into the seas, I pulled steadily on, rising and falling on the great swell. The squall struck with a rush and roar. A dash of salt spray swept over me, to which I bent my head. As the canoe gathered from the shock I drove the oars into the wave with a strong pull and her prow rode high on its foaming crest and then slid down into the dark hollow beyond. She rode them well at first, but soon the sea increased. The foaming crests began combing high in air, and between them yawned great, dark, cavernous valleys, which seemed about to engulf the little craft. Soon the white combers began to curl over the high bow, and the chill water washed over my feet. She would have weathered it had she been light, but she was too heavily loaded. This would not do! The canoe was filling, and I could not leave the oars to bail her, as my safety depended on keeping her head on. Even this was hard to do in the face of the gale which swept the crests of the great seas. There was only one thing to be done. I must get her stern-on and run before it. Watching my chance I let her broach just as the crest of a wave passed, and in the hollow before the next I turned her by backing and pulling with might and main. As I dropped both oars in the water for my long, strong pull, the foam of the oncoming crest was curling about her stern.

"Far away, miles to leeward, was a small island, the only land she could possibly live to reach. For this I headed her. Looking astern, I could see the work that was cut out for me. Far as the eye could see, the seas were rising, foaming, piling higher every minute. The wind swept down like a winged demon on their track. It was life or death then, for should one of those great seas overtake me and break over that low stern, my race would be run. No man could swim long in that cold water. I strained my eyes at the distant shore point with which I had lined her stern for steering. As every wave rose I knew that I must pull the canoe out of the grasp of that foaming giant, and as the crest lifted her again and threw her sideways, I knew that she must be brought stern on again, before the next one struck her. 'Catching a crab' over which we made much fun when learning to row, would be fatal now. Nerved by this certainty, I exerted all the strength and skill that was in me. My muscles seemed to rend and sharp pains shot through my arms, back and shoulders at the strain. Now the sturdy oars stood me in good stead.

"Still, in spite of all my efforts, great seas lifted the canoe bodily and threw her sideways into the trough; but I never lost my hold upon the oars, and setting my teeth I forced her to her course, though half full of water. It puts the courage of desperation into a man's heart to sit in a sinking canoe and watch a great wave tower over the stern and then rush to break and overwhelm him. Wet from my morning bath, sitting in a foundering boat with aching muscles, straining eyes and set teeth, I struggled on and on.

At last I heard the welcome boom of the surf beating on the rocks. The thunderous sound put new life into me, but it was off to my right. The strong spring tide was carrying me past the island, so bracing myself for one great effort, I strained on the oars until at last I floated in the smooth swell behind the kelp reefs under the lee of the island, and pushed the canoe on the beach just as she was foundering.

"My precious specimens were safe in their watertight box, but everything else was soaked as I reached the shore. . . . Here I built a great fire and dried out everything, then rolled in my blankets, thankful to be once more safe and dry. . . . Next day I rowed some twenty-five or thirty miles, and camped on a point of Vancouver Island, where a searching party of worried friends found me. It was the Sabbath, and people from town were out enjoying the beautiful weather. As I passed one of these family gatherings, a little boy shaded his eyes with his hands while he gazed at my outfit, and his high thin voice was plainly audible as he called 'Oh see, Ma, there's an Injun.'"

It was in September of that same year that Mr. Forbush collected, near Comox, British Columbia, several specimens of a bird which was new to science and which his friend Mr. William Brewster later described and named for its discoverer. In the Auk for January, 1889, Mr. Brewster wrote:

"Lincoln's Finch has been repeatedly cited as a good example of a 'hard and fast' species, which, although of wide distribution, is not subject to geographical variation. The specimens above described, with another male taken at the same place and season, show, however, that it has not been able to resist the potent modifying influences of the Northwest Coast Region. These influences have worked in quite the usual way, deepening the normal ground coloring and broadening and intensifying the normal markings. The differences are well marked and easily recognized. Indeed in a series of nearly one hundred specimens of *lincolni* from various parts of North America and Mexico I have found only three which approach the new form at all closely."

Mr. Forbush himself has described the collecting of this new race very briefly in the Bulletin of the Essex County Ornithological Club for 1920, where, in "Notes on the Lincoln's Sparrow," he wrote: "The only occasion on which I have ever seen more than one at a time anywhere, was a loose flock feeding in an open field at Comox, Vancouver Island, British Columbia, September 8, 1888. Their habits, notes and general appearance at that time seemed to differ much from those of our eastern bird, and a specimen taken then was used by Brewster as the type of *Melospiza lincolni striata*, Forbush's Sparrow. For the distinction conferred upon me I felt duly grateful and at the time fully believed that I had discovered a new bird. Since then grave doubts have assailed me, as others of my supposed discoveries have been relegated to the scrap heap. This may be as good a geographical race as some now recognized, but probably the future will see this subspecies and many others eliminated from the list of North American birds. In my opinion it would be about as well to eliminate all geographical races as to carry the craze for discovering and naming them so far as in some instances it has gone already."

Upon returning to New England after this visit to the Pacific coast, Mr. Forbush

again threw himself into the activities of the Worcester Natural History Society. He also organized the Brewster Ornithological Club, composed of active bird students of Worcester and its nearby towns, and he served as the first president of this club. In 1891 he began making plans for a collecting trip to Newfoundland, hoping to explore the seldom-visited and heavily wooded interior of that island, which has since furnished the types of a number of geographical races of birds and mammals, but he relinquished this plan upon his appointment as Director of Gypsy Moth Suppression in Massachusetts.

Some years previously the Gypsy Moth, *Ocneria dispar*, a European pest, had become established in the suburbs of Boston and its ravages were causing great consternation among the people of the state. Large regions of orchard, garden and woodland alike were being stripped bare and tremendous financial loss was threatened unless steps could be taken to suppress the destructive creature. Local measures seemed entirely unavailing and in 1890 Governor Brackett appointed a commission to investigate conditions and to make recommendations as to means of remedying them. In 1891 this commission was reorganized and the new commission, with the approval of Governor Russell, appointed Mr. Forbush as director of the work. The appointment was entirely unexpected and unsolicited, and indeed it was undesired, but his sense of public obligation impelled him to accept the work and to throw all his energies into it in his characteristic fashion. A plan of campaign was quickly organized and he enlisted a corps of assistants. The distribution of the moth and its life history, both in this country and in Europe, were carefully studied. An experiment station was fitted out, where the feeding habits and other details could be studied under ideal conditions. Especially pertinent were the studies of the possible means of suppression to be adopted. Parasites, native and foreign, were thoroughly tested and every conceivable enemy of the moth was investigated. Mechanical and chemical agents were tried, such as scraping off the egg clusters, creosoting them, burning the leaves under the trees, applying tree ink and other "tanglefoot" compounds, and spraying with various poisons. Records were made of all the birds which were seen to prey upon the moth in any of its stages, and efforts were made to increase the numbers of these beneficial birds.

The work was started with enthusiasm and considerable optimism, but was doomed to failure from the start. If the director had received the support from the people that his efforts justified, results might have been very different. Mr. Forbush very quickly recognized the gravity of the situation and realized that halfway measures would not succeed. Larger appropriations were sought but the short-sighted policy and sectional jealousies of the legislators cut them down each year. Residents of the state outside of the infested areas could not be convinced of the danger in the wider spread of the pest, and they refused their coöperation in attempting to restrict it to the regions already involved. Small demonstration areas were cleared of the insect, showing clearly what might have been done on a larger scale had sufficient funds been available, but petty politics defeated the plans of the director and the commissioners. Once Mr. Forbush

resigned, but was induced to serve longer. In the spring of 1900, however, after he had served faithfully for nine years, the politicians rewarded his sincere efforts by cutting in half the appropriation asked by the Gypsy Moth Commission for its work, and Mr. Forbush again handed in his resignation with the demand that it be accepted at once. He left the work with the sympathy and best wishes of the Gypsy Moth Commission and of the Department of Agriculture and of all with whom he had been in contact in his difficult position.

In 1896, after the work had been well started and new methods had been carried out with considerable success, Mr. Forbush prepared, with Prof. Charles H. Fernald of the Massachusetts Agricultural College, a monograph on the Gypsy Moth and its suppression, which is still recognized as a classic of its kind.

In 1893, largely because of his work in studying the relations of birds to the Gypsy Moth, Mr. Forbush was appointed Ornithologist to the Massachusetts State Board of Agriculture. In the beginning his work was largely that of a consultant and advisor. With the relinquishment of his connection with the Gypsy Moth Commission, more and more time was given to his studies of economic ornithology. His home in the northern suburbs of Boston had been an experiment station for some time and he later acquired a place at Wareham, near Buzzards Bay, where he could continue his researches in practical ornithology. It was at this latter place that he gathered the data which he later published under the title "Two Years with the Birds on a Farm," and which showed in clear and graphic manner the actual benefits which may accrue from an increased population of insect-eating and weed-destroying birds. He also spent much of his time at this period at the estate of his friend, Mr. William Brewster, in Concord, Massachusetts, where the two congenial spirits could ramble about the quiet countryside together, studying the haunts and habits of the wild creatures about them.

In 1900 and again in 1905 Mr. Forbush made trips to Florida, and at one time or another visited practically all of the eastern states. Many of these trips were for lecture purposes and others were connected with the growing movement for conservation. In 1905 the State Board of Agriculture was authorized by the legislature to publish "a special report on the birds of the Commonwealth, economically considered," and Mr. Forbush's resultant volume, "Useful Birds and Their Protection," was immediately recognized as an extremely valuable and timely book. It passed through several editions after its first appearance in 1907, and is still in constant demand, being used as a textbook in many schools and consulted whenever economic ornithology is discussed.

This volume contains, in clear and nontechnical language, the results of Mr. Forbush's extended studies of the food habits of birds, as well as the researches of others. An indication of the thoroughness with which his investigations were carried on, as well as of the originality of some of his methods, is shown in his study of the food of nestling Tree Swallows, Purple Martins, Bluebirds and other hole-nesting birds. Cameras were set up within a few feet of the nests occupied by young of these species, and photographs were made whenever the parents brought food to their young. Many hours were spent in this

work and in watching the birds from the cramped confines of an "umbrella blind." The resultant photographs, enlarged, revealed the nature of much of the food brought to the young.

Many of the illustrations for "Useful Birds and Their Protection" were from carefully prepared pen-and-ink drawings by the author and this is also true of several others of his writings.

In 1908 Mr. Forbush became officially the Massachusetts State Ornithologist, a position which he held until 1920 when, following the reorganization of the various state boards and the formation of the Massachusetts Department of Agriculture, he became the first Director of the Division of Ornithology.

Long before this Mr. Forbush was widely known as an active conservationist. He was one of the founders of the Massachusetts Audubon Society and for twelve years its president. In 1907 he became field agent for New England of the National Association of Audubon Societies and from that time on his attention was given more and more to protective legislation. He saw great changes take place in the attitude of the public towards our wild life. In his youth practically no protection was given to any of our birds. Game birds were shot at all times, were snared and netted, were sold in the public markets, and their eggs were collected in great numbers. Song birds were killed by anyone who owned a gun, especially by boys, but many were also trapped and caged. Birds of bright plumage were slaughtered for millinery purposes and our native insectivorous and seed-eating species were entirely unprotected by law. Reservations for wild life were practically unknown.

All this is tremendously changed today, and Mr. Forbush was in the forefront of the battle in procuring protection for our diminishing wild life. To list all the progressive legislation which he helped to secure would take too much space and it is sufficient to say that for the more than twenty years in which he was associated with the National Association of Audubon Societies, he took an active part in every advance in bird protection, appearing at countless legislative hearings in all the New England states, giving hundreds of lectures on bird conservation in which he usually stressed the important economic status of our birds, and contributing very many articles to the newspapers and magazines which were instrumental in shaping public opinion. He personally visited many of the sea bird colonies in New England and a number of these became sanctuaries as a result of his visits and subsequent reports.

At the time when the United States Department of Agriculture decided to establish an Advisory Board to assist it in handling regulations under the original Migratory Bird Treaty with Great Britain, Mr. Forbush was one of the seven men who were asked to form the original board. He continued to serve on the Advisory Board until his death and his counsels were much appreciated by the other members of this board.

Mr. Forbush was also connected with numerous other organizations interested in birds or their conservation. He was the first president of the New England (now the Northeastern) Bird Banding Association and of the Federation of the Bird Clubs of New

England. He was for many years a corresponding member of the Nuttall Ornithological Club, and also maintained a membership in several other similar organizations.

During the last twenty-five years of his life he published many pamphlets on bird protection and on economic ornithology, under the auspices of the Massachusetts State Board of Agriculture and its official successor. Among them were papers on such subjects as "The Farmers' Interest in Game Protection," "Rats and Rat Riddance," "Bird Houses and Nesting Boxes," "The English Sparrow and the Means of Controlling It," "The Starling," "Food Plants to Attract Birds and Protect Fruit," "The Domestic Cat, Bird Killer, Mouser and Destroyer of Wild Life," "The Natural Enemies of Birds," "Food, Feeding and Drinking Appliances and Nesting Material to Attract Birds," "Outdoor Bird Study," "The Utility of Birds" and "Some Under-water Activities of Certain Waterfowl."

He also produced a volume entitled "A History of the Game Birds, Wild-Fowl and Shore Birds of Massachusetts" which was published by the Commonwealth in 1912 and was re-printed in 1916. This book placed before the public for the first time, in clear and concise form, the actual facts regarding the decrease of many of our important birds which are hunted for food or for sport, and the value of the book was far-reaching.

One of the most successful of Mr. Forbush's methods of collecting and disseminating information about birds was by means of a bulletin, "Items of Interest," issued monthly for a number of years. Mr. Forbush enlisted the coöperation of a force of several hundred volunteer observers, who reported to him the results of their observations of bird activities. From the great quantity of data thus obtained each month, he prepared a resumé which was distributed among his correspondents and to various organizations interested in bird study. The results of this system in stimulating careful field observations among a widely distributed group of bird students were most excellent and an immense amount of valuable material was amassed.

Had Edward Howe Forbush written nothing more than we have already mentioned, his place among scientific ornithologists would have remained secure. But every step which he had taken was leading, consciously or unconsciously, toward his great and final work, "The Birds of Massachusetts and Other New England States." The three volumes of that book are the culmination of his many years of bird study and research, the outgrowth of his deep and abiding love for our feathered neighbors, the summit towards which all his earlier efforts had been urging him forward.

The first volume, covering all the water birds, ducks and geese, marsh birds, and shore birds, met with the instant approval of the scientific ornithologist and the amateur bird lover as well. The edition of five thousand copies was quickly exhausted and was followed by a second and a third printing. The second volume, comprising the game birds, birds of prey and the perching birds through the grackles, was issued in 1927 in an edition of seventy-five hundred copies and like its predecessor was quickly out of print and another edition of twenty-five hundred copies was necessary. The third volume treats the song birds and a few extirpated species not described in the earlier volumes.

These volumes are illustrated with finely reproduced paintings by the late Louis Agassiz Fuertes and by Major Allan Brooks, and with halftones and line cuts of some of the rarer birds, as well as by numerous distribution maps prepared from data collected by Mr. Forbush.

The books reflect in a multitude of ways the personality of their author, revealing as they do, so many intimate though brief glimpses of the man himself. His never-ending joy in watching even the commonest birds, his thrill when as a boy he saw his first Ruffed Grouse and which was duplicated hundreds of times in later life, his discerning interest in the feeding activities of the little Red-eyed Vireo which first led him into a consideration of the economic value of our birds, his early awakened realization of the necessity of protecting and encouraging our bird population — all these are revealed in the pages of these volumes, together with a thousand other little personal touches.

The manuscript of the third and final volume was rapidly nearing completion when Mr. Forbush laid down his pen for the last time. He had exhausted himself in his constant concentration on the work which he had laid upon his frail shoulders and a sudden cold, in his weakened condition, quickly developed into pneumonia and he passed away, at his home in Westborough, on March 7, 1929, in his seventy-first year.

We honor the memory of Edward Howe Forbush for his outstanding accomplishments in economic ornithology, we praise him for his great work in wild life conservation and protection, we read again and again his charming descriptions of the intimate lives of our feathered neighbors, but it is still another side of the man himself which has endeared him to his host of friends and which renders so poignant our sense of loss in his passing. He held a most unusual place in the hearts of hundreds of persons who had never met him face to face but who knew him through the revelation of his writings. His sincerity and singleness of purpose, his patience and tactful consideration, his friendly interest in the problems of the veriest tyro in bird study, gave a personal touch to all his relations with others. Visitors found him a patient listener, always ready to draw upon his great store of knowledge for their benefit. He was modest and unassuming in his bearing, but when, as a result of thorough investigation and keen judgment, he formed an opinion, he was ready to back it against any man or group of men, and his ideas were valued accordingly. His kindliness, his saving touch of humor, his never-failing sense of justice, won friends even among those who opposed him in matters of policy in conservation, and he accomplished his ends with a minimum of effort as, tall, spare, and almost ascetic in appearance, he moved quietly about his chosen work.

There must be a tremendous satisfaction in knowing that one has made a real contribution to the welfare and happiness of many, many people, and this satisfaction belonged to Mr. Forbush. Honors came to him during his life in the recognition afforded him by many scientific organizations and those devoted to conservation. A few months before his retirement from the Division of Ornithology, the Advisory Board of the Massachusetts Department of Agriculture awarded him a gold medal "For Outstanding Achievement in Economic Ornithology." The Federation of Bird Clubs of New England

purchased a great tract of wild land in Berkshire County and presented it to the Commonwealth as a perpetual sanctuary, "The Edward Howe Forbush Wild Life Sanctuary." The Boston Society of Natural History published as one of its "Proceedings" a biographical sketch and bibliography of Mr. Forbush, which was issued on his seventieth birthday, on which date the Associated Committees on Wild Life tendered Mr. Forbush a complimentary dinner at the University Club in Boston.

On the edge of the little village of Westborough, where he had lived so many years of his long and useful life, is the quiet graveyard where his friends gathered in March, 1929, to do last homage to Edward Howe Forbush. His was a clean and upright life, dedicated to the advancement of interest in natural and simple things, and it was most appropriate that, as he was laid away to his last long rest, birds called in the near-by pines, and among the beautiful flowers which covered him, there lay a simple spray of pussy willows, "from the woods he loved so well."

BIRDS OF MASSACHUSETTS

AND OTHER NEW ENGLAND STATES

PART III

FAMILY **FRINGILLIDÆ.** FINCHES, SPARROWS, GROSBEAKS, ETC.

Number of species in North America 92; in Massachusetts 41.

This is the largest family of birds, including about 600 species distributed throughout the world. It is also the largest family in North America. In all the species the bill is hard and more or less cone-shaped — a form which combines strength for crushing hard seeds with delicacy of touch in selecting minute objects, thus fitting the *Fringillidæ* for taking into the mouth very small seeds and insects, as well as larger ones. Usually the bill is more or less convex, but sometimes it is slightly concave; the nostrils are placed up near the ridge or culmen, and in most cases are not covered by feathers. The upper mandible has sharp cutting edges which for the most part run nearly straight from its point to or near the base of the bill, bending down there at a sharp angle, which is followed also by the lower mandible. There are some species with small bills in which this character is barely evident, as the bend or angle of the edges of the beak is very slight, but on the whole this character will separate the *Fringillidæ* from all other American families except the *Icteridæ*, some of which are exceedingly sparrow-like. The wings have but nine primaries developed. The tarsus is typically *Oscine*, scaled in front and covered with an undivided plate on each side which is ridged behind. All grosbeaks, finches, crossbills, buntings, linnets, juncos, towhees and sparrows belong with the *Fringillidæ*. Most of these birds sing well and some excellently. Most of the sparrows are clad in dull inconspicuous plumage that harmonizes well with the ground on which they largely feed, but the males of some arboreal finches are very brilliantly colored. Most birds of this group nest either on the ground or rather low in shrubbery or trees.

Economic Status. The *Fringillidæ* are known everywhere as seed-eaters and can subsist wherever their favorite seeds are accessible, even in winter. In seasons when insects are plentiful, they feed largely on them, particularly in spring, and on account of the destruction of noxious insects and the seeds of weeds they are generally considered useful. Some species of this family attack grain in the fields, and doubtless they distribute weed seeds to some extent. However, as the seeds eaten are almost all cracked and ground up in the powerful gizzard, it is probable that few are passed in condition to germinate.

Hesperiphóna vespertína vespertina (W. Cooper). Evening Grosbeak.

Plate 63.

Description. — Bill sparrow-like, but enormous for size of bird, much larger than that of Pine Grosbeak, and nearly as wide as high at base, its lateral outlines nearly or quite straight; nostrils sparsely covered by short bristly nasal feathers; wings pointed, tips folding beyond middle of tail which is slightly forked; feet rather small; markings in both sexes variable. *Adult male:* Forehead, broad stripe over eye, scapulars, rump and extreme upper sides of breast, also sides, flanks and posterior under plumage yellow, becoming bright yellow on rump and paler on extreme posterior under plumage (longer under tail-coverts sometimes partly white); narrow line around base of upper mandible, top of head (from top of forehead), wings, upper tail-coverts and tail black or blackish (except inner flight-feathers, which are white or grayish-white, sometimes tinged or edged with yellow outwardly); rest of head, neck, back, breast and center of belly brownish-olive, darkest on head and neck, and changing gradually into yellow where it meets that color; wing linings black and yellow; bill "a decided greenish-yellow, a little more green on the edges, more yellow in the center" (M. J. Magee), or pale yellowish-green, occasionally with a rosy tint; iris brown; legs "reddish-gray" (Miss B. W. Moses), "deep flesh-color" (M. J. Magee). *Adult female:* Smoke-gray, darkening on head and paling on rump and upper tail-coverts as well as below (longer upper tail-coverts black with whitish tips), often slightly mottled with darker, and sometimes mixed with a little olive or yellowish; wings and tail largely black, varied with pale gray and whitish; wing linings much as in male, but paler yellow; tail chiefly black but inner webs broadly light gray toward end; black patch in middle of upper tail-coverts, narrowing toward tail; dusky streak along lower jaw; bill "a little duskier" (M. J. Magee). *Young in first winter plumage:* Much like adults, but immature males usually may be distinguished by blackish or dusky inner margins of tertials. *Young in juvenal plumage (sexes alike):* Resemble adult female, but more brownish, lower plumage paler and more buffy, and markings less sharply defined.

Measurements. — Length 7.00 to 8.50 in.; spread 13.00 to 13.80; folded wing 4.20 to 4.55; tail 2.60 to 3.20; bill, culmen .72 to .83, depth of bill at base .55 to .70, breadth about .60; tarsus .70 to .80. Sexes nearly alike in size, though female is usually slightly smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt of natal down, assumed as young bird is fledged; first winter plumage by partial postjuvenal molt of body feathers and wing-coverts, juvenal flight-feathers and tail retained, tertials may be shed in some cases; first breeding plumage by wear, supplemented possibly in some cases by slight spring molt about head and neck, flight-feathers and tail are worn and brown as compared with those of adults; adult winter plumage produced by complete postnuptial molt when bird is more than a year old; adults have complete postnuptial molt and breeding plumage is the result of wear, though some appear to molt slightly about the head and neck.

Field Marks. — Catbird size but stouter. *Adult male:* Great, stout, pale yellowish-green beak and striking contrast of colors (black, white and yellow) distinguish adult male at once from any other winter

PLATE 63

PLATE 63

PINE GROSBEAK

Page 5

Immature Male

Female

Adult Male

PURPLE FINCH

Page 10

Adult Male

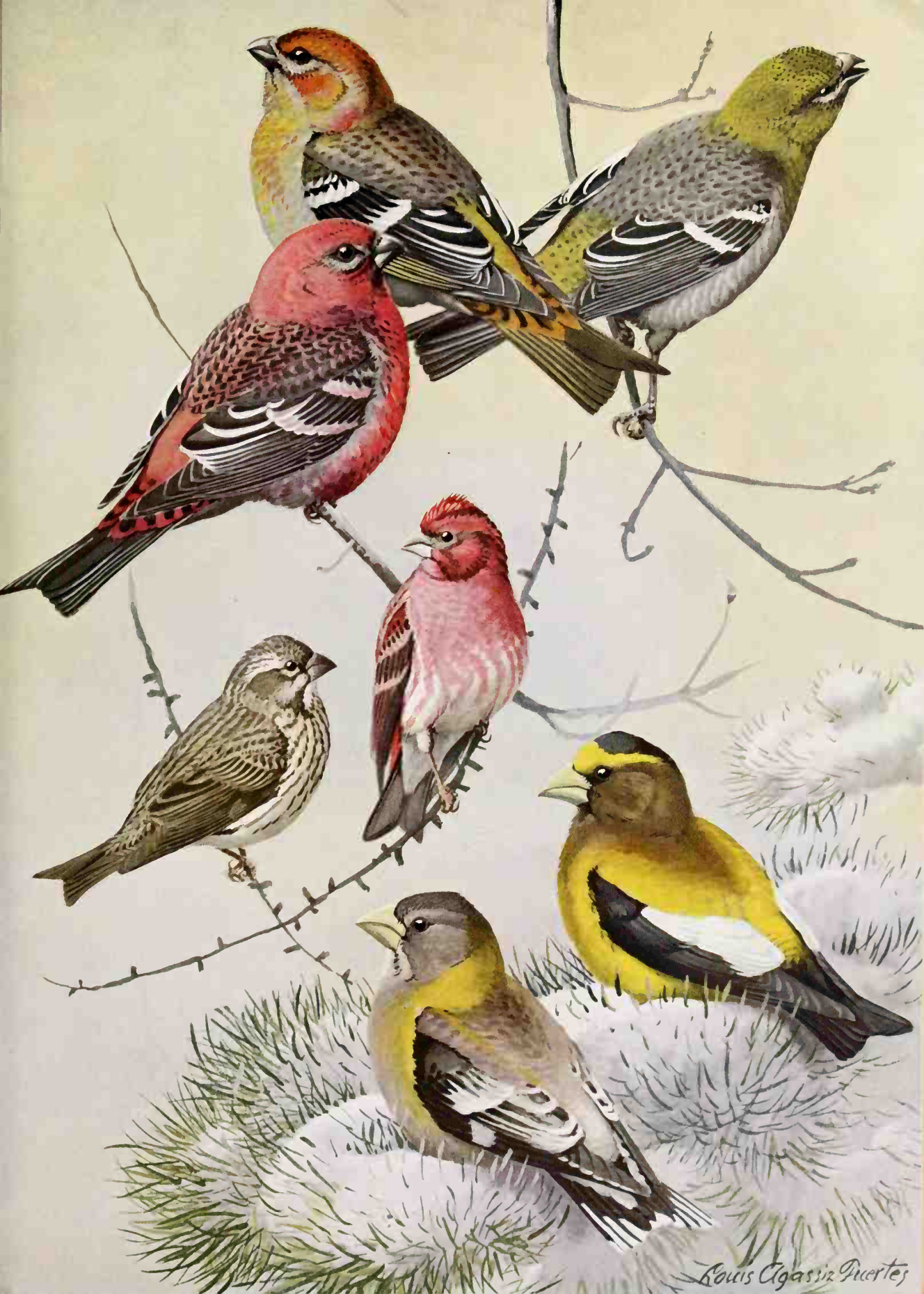
Female or
Immature Male

EVENING GROSBEAK

Page 2

Adult Male

Female


Louis Agassiz Fuertes

bird; large white patches in black wings of male show distinctly. *Female and young:* Resemble male closely in size and shape, have no streaks and little yellow, but show much pale gray or whitish on black wings; the large pale bill is diagnostic; flight somewhat undulating.

Voice. — Calls, "a shrill '*cheepy-teet,*' and a 'frog-like *peep*'" (F. M. Chapman); a short, shrill trill of alarm (Chandler Foot); a cross between call of hyla and "English" Sparrow (Mrs. W. H. Herrick); male, "a single metallic cry like the note of a trumpet," female, "a loud chattering" like the Bohemian Waxwing; song, "a wandering jerky warble" (S. E. White); also a pleasing "crooning sound" when feeding (Mrs. G. E. Burbank).

Breeding. — Breeding habits probably unknown. Francis J. Birtwell describes and illustrates the nest and eggs,[1] but his birds probably should be assigned to the western race of the species. R. M. Marble records a nesting pair in Woodstock, Vermont, but no nest or eggs were seen, only the fledged young (see record below under "*Distribution in New England*"). L. Osborne Scott reports that on June 18, 1899, he found four nests of this species, with eggs, near Winnipeg, Manitoba, but gives no description of the eggs, except to say that they "are more blotched than those of the Red-breasted [Grosbeak] and not so spotted." The nests were about 12 or 15 feet from the ground in willows on the bank of the Red River, rather flat and slight, built of sticks and roots.[2]

Range. — Central and central-eastern North America. In summer north and west to central Alberta, southern Manitoba and western Ontario, south to northern Minnesota and northern Michigan and east to central Vermont; winters from central Alberta, southern Saskatchewan, southern Manitoba, southwestern Quebec, Nova Scotia (casually) and New England south to central Texas, central Missouri, western Kentucky, Illinois, Indiana, Ohio and southern Maryland.

Distribution in New England. — Formerly unknown but of late years more or less common and regular winter visitor south to Rhode Island and Connecticut, where more rare and irregular; quite common in some winters; accidental in summer in Maine, New Hampshire and Vermont. Breeding record: *Vermont:* Woodstock, July 13 and 14, 1926, a pair seen with four newly fledged young.[3]

Season in Massachusetts. — (September 3 and 9) November 5 to May 20.

History. The Evening Grosbeak is a remarkable bird. It resembles the common Grosbeak or Hawfinch of Europe, but is quite distinct from it. It is a typical seed-eater with a large, powerful, fringilline bill, and was regarded until within the past fifty years as typically a bird of the far northwest. Its generic name is derived from the Greek, referring to the *Hesperides,* "Daughters of Night," who dwelt on the western verge of the world where the sun goes down. It was discovered in 1823 by Henry R. Schoolcraft and named in 1825 by W. Cooper from a specimen taken at Sault Ste. Marie, Michigan. It was called the Evening Grosbeak as it was then observed to sing only at evening. Whatever may have been its distribution and habits then, it is no longer a distinctively western bird nor does it sing only at sundown.

The first recorded extension of its range east of the Great Lakes was at Toronto in 1854. About the beginning of the last quarter of the nineteenth century there seems to have been some increase of the species in winter in the northern tier of mid-western states. The first verified occurrence of the species in Indiana, according to Dr. A. W. Butler, was in November, 1878, although it was reported there in 1876.[4] In the winter

[1] Auk, Vol. XVIII, 1901, pp. 388–391.
[2] Ottawa Naturalist, Vol. XIII, 1899, p. 196.
[3] Marble, R. M.: Auk, Vol. XLIII, 1926, p. 549.
[4] Butler, A. W.: Birds of Indiana, 22nd Report of State Geologist, 1897, pp. 912, 913.

of 1886–87 its numbers increased in Indiana, and it was noted in Ontario and also in some numbers in western Kentucky in the spring of 1887, and a few reached New York State.[1] Up to the winter of 1889–90, however, it was almost unknown in the East, and even as far west as Ohio. In that winter a great eastward migration occurred, which in January, 1890, penetrated almost to the Atlantic coast of Massachusetts. After that the species came east from time to time in winter, and in 1910–11 there was another great eastward movement.

From that time onward these birds were observed in New England every year, and they gradually became uncommon to common winter visitors to New England as far south as Rhode Island and Connecticut, in which states they are less common and regular than in Massachusetts. For the last ten or twelve years they have visited Massachusetts every year in varying numbers, and have appeared in most of the towns in the state. The flocks have varied in numbers from a few birds to about 100, and one flock of about 150 was reported. In certain years few birds have been noted, in others the species has been reported from about half the towns in the state. It was first suggested by Dr. Walter Faxon, I believe, that the movement of these birds east in winter was facilitated by the planting of the ash-leaved maple or box-elder (*Negundo aceroides*) in tree claims across the western plains as well as in the East. The buds and seeds of this tree seem to be preferred by these grosbeaks to those of all other trees.

Recent bird-banding records quite clearly show that in migration these birds move east and west. Four birds banded by Mr. M. J. Magee at Sault Ste. Marie, Michigan, have been taken, two near the city of Quebec, Canada, one in Connecticut and one in Massachusetts, and Mr. Magee himself has recently taken one which was banded in Hanover, New Hampshire.[2]

Haunts and Habits. That gifted writer, Dr. Elliott Coues, says of the Evening Grosbeak: "In full plumage this is a bird of distinguished appearance, whose very name suggests the far-away land of the dipping sun, and the tuneful romance which the wild bird throws around the fading light of day; clothed in striking color-contrasts of black, white and gold, he seems to represent the allegory of diurnal transmutation; for his sable pinions close around the brightness of his vesture, as night encompasses the golden hues of sunset, while the clear white space enfolded in these tints foretells the dawn of the morrow."

Seen for the first time amid the snows of winter and against a background of darkling pines, these strange and beautiful waifs of the northland seem somehow out of place, as would some rare and singular exotic plant blossoming in a New England winter. Their presence here appears almost miraculous. They usually come without warning very late in autumn, and as suddenly disappear in spring. They are swift of flight, and when on the wing thread their way easily through the branches of the forest. Where food is plentiful, they are quiet and sedentary, gentle and unafraid, though they soon become

[1] Auk, Vol. IX, 1892, pp. 240–247.

[2] Magee, M. J.: Bulletin, Northeastern Bird-Banding Association, Vol. IV, 1928, p. 56 and *in litt.*

cautious if molested. Where people feed them and use them well, they return winter after winter, and often spend a part of each forenoon at the feeding place. Some of them at times become so tame under good treatment that they will almost eat from the hand. During their stay with us they feed almost entirely on vegetal matter and chiefly on seeds. They are fond of bathing even in winter, and visit unfrozen parts of swift streams at this season to bathe and drink, and, like several other birds, they drink the sap of maple trees wherever they find it. Mrs. H. J. Pratt has noted that in February they snap off small twigs to drink the sap that flows from the breaks.

As spring approaches there is some attempt at song and courtship on the part of the most vigorous adult males, and now and then one may be seen prancing before a female with wings and tail opening and closing to exhibit his charms to the utmost, but probably the full courtship display is witnessed seldom in this latitude.

Usually their favorite food at feeding stations is sunflower seeds, and where these are to be had other food seems not to interest them much, except perhaps the seeds of their favorite box-elder. They feed also on the seeds of pine, spruce and other coniferous trees, cottonwood, locust, birch, wild cherry, maple, ash and tulip trees, on the seeds of lilac and flowering dogwood, and on the buds of many deciduous trees, including the poplar, maple, walnut, elm and apple; they feed to a limited extent on buds of coniferous trees; also on a considerable number of winter fruits, among them apples, crabapples and hawthorn and berries of the sumac, privet, buckthorn, mountain ash, poison ivy, Virginia juniper or "red cedar" and barberry, all of which apparently are eaten chiefly for their seeds, as most of the pulp seems to be discarded. At times they take the seeds of ragweed, burdock and other tall weeds, and even partake of seeds and grains found in horse droppings in the roads. At feeding stations they may be attracted by the seeds of sunflower and hemp, as they are fond of both. In some places they seem to prefer the pits of the chokecherry to any other food. They eat the leaves of some trees also, and especially the tender leaves of succulent plants. Some of these birds, kept in confinement, refused all insects offered them, though probably they consume insects in the breeding season and feed insects to their young.

Economic Status. The Evening Grosbeak seems to be a harmless species, but not particularly useful to man.

Pinícola enucleátor leucúra (Müller). Pine Grosbeak.

Other names: CANADIAN PINE GROSBEAK; CANADIAN GROSBEAK.

Plate 63.

Description. — Larger and generally darker than Evening Grosbeak; bill shorter, smaller and more convex, upper mandible slightly hooked, nostrils hidden by nasal tufts which reach nearly half length of bill; wing as long relatively as in Evening Grosbeak; tail longer, slightly forked; under tail-coverts barely reaching half-way to fork of tail; tarsus short; feet small, but larger than in Evening Grosbeak. *Adult male:* Very variable; general color dull rose-pink or rosy-red in winter, lighter or poppy-red in summer (some males, probably immature, show much orange); nasal tufts and more or less of lores and

eye region dusky or blackish; feathers generally gray toward base, the gray showing in places, especially on breast; upper back with dusky feather-centers, scapulars tending to gray; rump red; upper tail-coverts dusky, broadly margined and tipped red; wings and tail dusky, feathers of former with outer edges white, the white increasing in width on inner secondaries, widest on tertials; ends of middle and greater wing-coverts broadly white (sometimes tinged rosy) forming two conspicuous wing-bars; abdomen, upper parts of sides and flanks and under tail-coverts gray, varying somewhat in shade, the latter darkest (centrally), very broadly margined and tipped whitish; only highly plumaged males are bright; others, apparently adult, resemble female more or less, while some are as female; bill blackish or black, sometimes paler at base below; iris dark brown; legs and feet black. *Young male in first winter plumage:* Chiefly pale olive-brown above, otherwise resembling adult female in markings, often with reddish or yellowish tinge and rarely perhaps more like adult male. *Adult female:* General color brownish-gray or smoke-gray; top of head, rump and much of upper tail-coverts bright yellowish-olive, tawny-olive or rusty, fore parts often more or less tinged with same; markings of wings similar to those of male, with less white on outer edges of primaries, tail-feathers with more or less narrow, light grayish edges; very variable, especially in extent and shade of yellow. *Young female in first winter plumage:* Similar to young male, but duller. *Young in juvenal plumage:* Similar to adult female, but duller, browner, paler and more buffy below and markings less distinct; wings and tail olive-brown with paler or whitish feather-edges; bill lighter.

Measurements. — Length 9.00 to 9.75 in.; spread 13.75 to 14.87; folded wing 4.36 to 5.00; tail 3.60 to 4.50; bill .55 to .62; tarsus .75 to .92. Female usually but not always somewhat smaller than male.

Molts. — Juvenal plumage follows natal down by complete molt (August); first winter plumage acquired by partial molt chiefly of body feathers and some wing-coverts; first breeding plumage the result of wear, and in the next autumnal molt (July to September) most young are believed to assume adult winter plumage, though highest plumage may not be assumed for a year or two more, and some may remain always in a plumage like that of female.

Field Marks. — Approaches size of Robin, but more robust; short, thick, blackish bill; general rosiness of most adult males noticeable especially on head, rump and breast; black wings and tail, with two conspicuous wing-bars, and olive-yellow of females where males are red distinguish the species from other winter birds; lacks large white or pale gray area in upper wing shown by Evening Grosbeak. Flight usually undulating and accompanied by calls.

Voice. — Call, a note somewhat like that of a lost chicken; "a peculiar, querulous, whistled *caree* or *c-r-r-r-u* or *ca-r-a-r*" of warning; flight call "*pee-ah*"; call from perch like a warbled "*pee-ah-pree-pu*" (O. W. Knight); a low hissing squeaky sound of warning (E. O. Grant); usual flight call, two or sometimes three notes given quickly in a descending series *tēē-t'yĕh, tēē-tēē-t'yĕh,* or *tēē-t'yĕh-tē;* also a loud, rich, chuckling whistle of two to four syllables (Wm. Brewster); song, resembles that of Purple Finch (H. D. Minot); ventriloquial, sweet, varied and melodious, sometimes uttered softly in midwinter; when feeding oftentimes a "low murmuring or whimpering whistle" and a "low, harsh grating cry" (Wm. Brewster).

Breeding. — *Nest:* Not very high in coniferous tree or in bush in woods, sometimes in more open country; built largely of moss and twigs, lined with hair. *Eggs:* Commonly 3 or 4; .72 to 1.02 by .53 to .70 in.; color variable, greenish-slate, greenish-drab or light green, spotted and blotched with pale purplish-brown and dark purple, and sometimes also with very dark brown; "greenish-blue spotted with black and lilac" (O. W. Knight); figured by E. A. Capen in "Oölogy of New England," Plate VII, Fig. 13. *Dates:* Chiefly in May and June; a captive bird dropped eggs in July (O. W. Knight). *Incubation:* Period probably about 14 days as in the European form; chiefly or wholly by female. Probably but one brood yearly.

Range. — Northeastern North America. Breeds from northwestern Mackenzie, southern Keewatin, northern Ontario and northern Ungava (Quebec) south to northern Alberta, northern Manitoba, northern

Ontario, central New Hampshire, southern Maine, New Brunswick and southern Nova Scotia; winters from central Canada south to eastern Kansas, Missouri, Indiana, Ohio, Pennsylvania, New Jersey and (casually) southern Kentucky and District of Columbia. Other subspecies occupy the range of the species in Newfoundland and northwest to Alaska, west to the Pacific and across Eurasia.

Distribution in New England. — Resident, so far as known, only in the White Mountains of New Hampshire (above 3,000 feet) and in mountains of northern Maine; irregular winter visitor, sometimes abundant, but a few always present at that season as far south as western Massachusetts.

Season in Massachusetts. — October 24 to May 9.

Haunts and Habits. The robust, brilliantly colored Pine Grosbeak is an arboreal bird, living in northern forests around the world. It is seen in New England principally as a winter visitor, and although it visits Massachusetts nearly every year its numbers here are often so small that it escapes general notice. Occasionally, however, it appears in our territory in considerable numbers, and large flocks become more or less common from one end of the state to the other. The accepted belief is that they are driven south by "hard winters," but such winters can have only a secondary effect on birds so warmly clad and so well sheltered by coniferous forests, and deep snow is no hardship for birds that feed principally on buds, seeds and fruits of tall shrubs and trees. Severe winters may have a minor effect, but considerable flights of these birds arrive here occasionally in mild winters, as in the winter of 1923–24. When there is a heavy crop of beechnuts in northern Maine and the southern Canadian forests, the Pine Grosbeaks sometimes swarm in those regions and few come to Massachusetts, but a lack of wild fruit, cones and seeds in northern forests might compel these birds to seek food to the southward.

Dr. C. W. Townsend says that he observed a "failure in the cone crop of the spruces and firs in Cape Breton, Newfoundland and Labrador" in 1906 and inferred that there would be an incursion of Crossbills and Pine Grosbeaks into New England in the ensuing winter. His inference was justified.[1] A dry spring and summer in the north, resulting in a scarcity of wild fruit and seeds, may be the chief cause of the greater southward flights, especially if the dearth of food comes the next season after a year of plenty with its consequent increase in the numbers of the birds. A fire sweeping through a great forested region or a great irruption of spruce-destroying insects, such as sometimes occurs, might have a similar effect.

When Pine Grosbeaks come here in numbers from their northern solitudes, some of them, especially the younger birds, having had little experience with the wiles of man, are so unsuspicious that they may be taken by a noose on the end of a pole, or even captured by hand. Sometimes they take shelter in farm buildings and Miss Lena C. Wiley tells me that when a woman in Centerville, Massachusetts, tried to drive some of them from her woodshed, she had to catch one and put it out. She placed the bird on a vine and it hopped back to her shoulder. Nevertheless when persecuted by man the Pine Grosbeak, learning by sad experience, becomes more shy.

[1] Townsend, C. W.: Memoirs of the Nuttall Ornithological Club, No. V, Supplement to The Birds of Essex County, Massachusetts, 1920, p. 138.

Usually when these birds arrive in New England, those in the plumage of the females and young largely predominate. This may be accounted for in part by the fact that when the birds breed well the young always outnumber the adults in the autumnal migration; also most of the young birds apparently do not get their full plumage until the postnuptial molt in their second year, or even later, and it may be possible that some of the males never acquire high adult plumage but continue to wear a dress similar to that of the adult female, with yellow and orange largely replacing the red of the normal male. Adult males kept in cages assume a similar plumage. It is possible also that some of the older males acquire in time a plumage like that of the female, and we know that a few adult females assume red tints on head and rump.

The song of this bird has a ventriloquial quality, in that sometimes when near-by it seems to come from a distance. As bird music goes it is very fine, full of warbles and trills, and often is given very softly with many tender notes. Sometimes the males sing in winter, even when the thermometer falls well below zero, "singing of the northern summer — clear and cool like the wind among the fir trees." Thoreau refers to their song and their "dazzling beauty" and terms them "angels from the north."

Pine Grosbeaks rarely appear in Massachusetts in any considerable numbers before November. During their stay with us they are seen usually in small parties, although occasional flocks of from thirty to three hundred birds have been reported. The few birds that appear early in autumn are mere stragglers. Their number increases in November somewhat, but usually no great numbers are seen until December, and often an increase occurs in January. On bright days in early February with the thermometer below the zero mark, some of the males, stirred by the approach of spring, may give forth a tender bit of song. About the tenth of February the northward movement usually begins and only stragglers are seen after March.

During their stay with us they frequent pine, hemlock and deciduous woods, and orchards and also hill pastures where many red cedars grow, and when very numerous they may be seen often in villages and cities where they feed on the buds and seeds of street trees. When they come in large numbers they quickly strip from the trees the fruit and seeds left upon them and so they constantly wander from place to place seeking food. Dr. Brewer tells us that in the winter of 1835, and for several succeeding seasons, Pine Grosbeaks were "exceedingly abundant" about Boston.[1] Perhaps the greatest irruption of these birds in more recent times appeared in the winter of 1892–93 in eastern Massachusetts, as recorded by William Brewster.[2] This is the best and most complete record of an invasion of these birds in this state, wherein he presents the following graphic picture of the feeding of a flock and its results:

"When I first saw them they were assembling in a large white ash which overhangs the street. This tree was loaded with fruit, and with snow clinging to the fruit-clusters and to every twig. In a few minutes it also supported more than a hundred Grosbeaks

[1] Baird, S. F., Brewer, T. M., and Ridgway, Robert: A History of North American Birds, Land Birds, Vol. I, 1905, p. 455.
[2] Auk, Vol. XII, 1895, pp. 245–256.

who distributed themselves quite evenly over every part from the drooping lower, to the upright upper, branches and began shelling out and swallowing the seeds, the rejected wings of which, floating down in showers, soon gave the surface of the snow beneath the tree a light brownish tinge. The snow clinging to the twigs and branches was also quickly dislodged by the movements of the active, heavy birds and for the first few minutes it was incessantly flashing out in puffs like steam from a dozen different points at once. The finer particles, sifting slowly down, filled the still air and enveloped the entire tree in a veil-like mist of incredible delicacy and beauty, tinted, where the sunbeams pierced it, with rose, salmon, and orange, elsewhere of a soft dead white, — truly a fitting drapery for this winter picture, — the hardy Grosbeaks at their morning meal. They worked in silence when undisturbed and so very busily that at the end of the first hour they had actually eaten or shaken off nearly half the entire crop of seeds. Some men at work near-by afterwards told me that this tree was wholly denuded of fruit by three o'clock that afternoon when the birds descended to the ground and attacked the fallen seeds, finishing them before sunset."

During the winter these birds bathe in the soft snow, standing in it, either on the ground or on the thick foliage of coniferous trees, fluttering their wings and throwing the snow-spray over their plumage in the same manner in which many birds bathe in water.

The Pine Grosbeak feeds chiefly on fruit and seeds of trees as well as tender leaves. Among the fruits eaten are those of the bush or mountain cranberry, barberry, mountain ash or rowan tree, Virginia juniper or red cedar, crabapple, apple, black alder, privet, hawthorn, buckthorn, sumac, Japanese barberry and waxwork (*Celastrus scandens*). It seems to eat fruits largely for the seeds, though some pulp is eaten. It eats buds of apple, maple, hickory or walnut, ash, hazel, pine, spruce, larch and other trees, and seeds of most of those named above, also those of the birches. It takes also seeds of roses. It is very fond of sunflower seeds and eats those of hemp, burdock, ragweed, lamb's-quarters and other weeds.

Economic Status. The Pine Grosbeak seems to be of no particular economic importance, and its only apparently harmful habit is that of feeding on apple buds. Little complaint of this habit, however, has been received.

Pinicola enucleator eschatósus Oberholser. Newfoundland Pine Grosbeak.

Description. — Resembling mainland Pine Grosbeak but decidedly smaller. Male "darker and duller above and below in both red and gray areas; female darker on upper and lower parts, the yellowish areas more purely yellow, less tinged with orange" (H. C. Oberholser).

Measurements. — *Male:* Folded wing 4.41 to 4.57 in.; tail 3.46 to 3.66; bill (exposed ridge) .55 to .59; tarsus .85 to .94. *Female:* Folded wing 4.09 to 4.17 in.; tail 3.31 to 3.62; bill .54 to .55; tarsus .82 to .92.

Range. — Newfoundland; south in winter to Massachusetts.

Distribution in New England. — A winter visitor. Records: *Massachusetts:* Canton (Ponkapoag), an immature male taken January 22, 1893, by J. H. Bowles;[1] Quincy, February 6, 1899, a female taken by G. Wilson, now in the Museum of Comparative Zoölogy, seems to be referable to this subspecies.

[1] Oberholser, H. C.: Proceedings, Biological Society of Washington, Vol. XXVII, 1914, p. 52.

NOTE. Probably this recently separated race of the Pine Grosbeak cannot be distinguished in the field from the larger race, as it seems to resemble *leucura* in every way except for the difference in size and coloration and in its range, and as no difference between the haunts, habits and notes of the two subspecies is known. Probably in its migrations the Newfoundland Pine Grosbeak occurs chiefly in the coastal region, and probably also it will be found to be not excessively rare.

Carpódacus purpúreus purpureus (GMELIN). Purple Finch.

Other names: RED LINNET; LINNET.

Plate 63.

DESCRIPTION. — Bill relatively about as large as that of Pine Grosbeak, short, conic; wing longer than tail, which is slightly forked; tarsus rather short; crown feathers erectile. *Adult male:* Variable; top of head crimson to "deep wine-purple," brightening in spring, brightest in breeding season; back and scapulars reddish-pink, reddish-brown or "wine-purplish" mixed with brownish-gray and streaked dusky; outer row of upper tail-coverts largely dusky; rump, stripe over eye, chin, throat and upper breast rose-red, or rose-pink or "pinkish-wine-purple," passing gradually into white or whitish on posterior lower plumage; under tail-coverts commonly unstreaked, longer ones rarely streaked dusky centrally, and in some high plumaged birds more or less pink toward ends; feathers before eye and about base of bill sometimes grayish; eye and ear regions and side of jaw usually brownish; wings and tail dusky, the feathers with pale reddish outer edges; two rather inconspicuous light wing-bars formed by tips of middle and greater coverts; below a variable red or pink, streaked on flanks, blending into paler or whitish on lower posterior plumage; wing linings mostly rosy when in high plumage; bill, rosy-red in highest plumage, otherwise dark brown above, slightly paler below; iris, legs and feet brown. *Young male in first breeding plumage:* Similar to adult female, but Wilson says that it may be distinguished from the female by the olive-green edging of the tail-feathers. *Adult female:* Above olive-grayish or olive-brownish, whiter below, conspicuously streaked dusky, except on middle of belly and under tail-coverts; wing-feathers and tail-feathers edged lighter and two inconspicuous light wing-bars; general coloration variable, especially on rump which may be tinged yellowish-olive, reddish-brown, mixed yellowish-olive and brown, rosy, etc.; some show a few red feathers elsewhere. *Young in first winter plumage:* Like adult female, but edges of wing-feathers often more or less yellowish and buffy. *Young in juvenal plumage:* Similar to adult female, dark wood-brown above, white below, streaked with deep olive-brown (except about middle of belly and vent) but streaks below narrower and usually less distinct than in adult; edges of wing-feathers as in first winter plumage; bill and feet pinkish-buff.

MEASUREMENTS. — Length 5.50 to 6.35 in.; spread 9.20 to 10.40; folded wing 3.12 to 3.47; tail 2.00 to 2.50; bill .42 to .50; tarsus .45 to .50. Weight, average about 1 oz. (B. H. Warren), average 27.73 grams (C. L. Whittle), a large male 1.12 oz. Female slightly smaller than male.

MOLTS. — Juvenal plumage acquired by postnatal molt of natal down beginning early, in the nest; first winter plumage by molt of body feathers and wing-coverts (July to September), wing and tail quills retained; first breeding plumage is result of wear; at first postnuptial molt (July to September) some birds apparently become as winter adults, but some males apparently molt into a dress resembling adult winter female, as the number of immature (?) birds seems unduly large, and some males may always remain in plumage like female; bird-banders and keepers of aviaries find that most males do not acquire highest plumage until four or five years of age; in caged birds yellowish-olive takes the place of red in adult males; adults have complete postnuptial molt.*

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* In reference to the plumages of the Purple Finch, see Magee, M. J.: Auk, Vol. XLI, 1924, pp. 606–610; Wilson Bulletin, Vol. XXXVIII, 1926, pp. 164–167; Bulletin, Northeastern Bird-Banding Association, Vol. III, 1927, pp. 101, 102; *also* Whittle, C. L. and Helen G.: Bulletin, Northeastern Bird-Banding Association, Vol. III, 1927, pp. 62–68.

Field Marks. — Size of Song Sparrow but with much thicker bill, more robust, and tail shorter, sharply forked. *Adult male:* Suffused largely with rosy-red, usually brightest on top of head and conspicuous on rump, throat and upper breast; a wide stripe of this red over eye; wings and tail mostly brownish or dusky, with no very prominent pale marks. *Female, immature and young:* Brownish-gray or grayish-brown above streaked darker, grayish below also streaked darker; large bill of female prevents confusion with other streaked sparrows.

Voice. — Call note in flight a single sharp *pit;* while feeding, *chip-chee* (E. H. Eaton), or *pĕ-weé* (R. Hoffmann); also a single whistle (heard chiefly in autumn), which recalls that of Crested Flycatcher (H. D. Minot); song a lovely warble somewhat like that of Warbling Vireo, but richer and more vigorous, often prolonged in flight.

Breeding. — Chiefly in hill country. *Nest:* Commonly in dense coniferous tree, but occasionally apple or other deciduous tree, from 5 feet (in top of hedge) to 60 feet high near top of coniferous tree or on limb near the stem; resembling that of Chipping Sparrow, but much larger and not so neatly made; well concealed; built of twigs and weed stalks, grasses, rootlets, bark fiber or other vegetal matter and lined chiefly with hair. *Eggs:* 4 or 5; .62 to .92 by .53 to .70 in.; elliptical ovate; like those of Chipping Sparrow but much larger; greenish-blue or bluish-green with dark brown or blackish spots and irregular lines, mostly wreathed round large end; figured by E. A. Capen in "Oölogy of New England," Plate VII, Figs. 14, 15. *Dates:* May 10 to June 19 (September 10), Massachusetts. *Incubation:* Period 13 days (F. L. Burns); chiefly or wholly by female. One brood yearly.

Range. — Central and eastern North America. Breeds in Canadian and Transition zones from central British Columbia, northeastern Alberta, northern Ontario, south-central Quebec and Newfoundland south to southern Alberta, South Dakota, southern Minnesota, southern Iowa (casually), northern Illinois, southern Michigan, Pennsylvania, northern Maryland, northern New Jersey and Long Island; in winter from Nebraska, southern Minnesota, southern Ontario, southern Quebec and Nova Scotia to the Gulf coast from Texas to Florida; recorded once in Colorado; accidental on Resolution Island, Hudson Strait.

Distribution in New England. — Common to uncommon resident, up to heights of about 3,000 feet; rather irregular in winter and rare or wanting at that season in some northern parts of Maine, New Hampshire and Vermont.

Season in Massachusetts. — Permanent resident, but found in winter only where some favorite food is plentiful.

Haunts and Habits. According to our color standards of the present day, the name "Purple Finch" is a misnomer. Doubtless the term was first applied by someone collecting for the first time a highly plumaged adult male. In full breeding plumage it displays some tints approaching the "royal purple" of the olden time, and to that color very likely was due the origin of its name. John Burroughs says that it appears as if a brown bird had been dipped in diluted pokeberry juice and opines that "two or three more dippings would have made the purple complete."

This favorite bird is one of the most melodious of New England finches. He pours out his gushing, ecstatic warble from the top of some tree, and when performing before his mate his musical efforts transcend his ordinary notes and he launches into the air, fluttering about with quivering wings in lowly emulation of the Skylark, pouring forth a continuous melody until, exhausted with this most remarkable vocal effort, he floats down with uplifted pinions toward the object of his affections. Mr. Harrison Lewis reports a number of males singing in concert on March 6 in southern Ontario, while still in a flock; occasionally a hardy male may be heard singing on a bright day in January.

Naturally the Purple Finch is a forest bird, and although it adapts itself readily to civilization it prefers the neighborhood of coniferous trees, and shuns open plains. Before the advent of the "English" Sparrow in the United States, Purple Finches nested in abundance in the region about Boston, building their nests chiefly in Norway spruces and Virginia junipers. The sparrows in time apparently drove a large part of these finches out of the region and kept them out, as they never have returned in their former numbers. Another factor inimical to the finches was the extension of building operations in the country around Boston, and the cutting of many junipers. The introduced Starlings also have tended recently to drive out the finches by eating the seeds of the juniper trees, on which the latter formerly fed in winter. Once, hundreds of Purple Finches wintered in the Boston region when "cedar" berries were abundant. Those who wish to keep these birds about both summer and winter should plant coniferous trees and should feed sunflower seeds, of which these finches are very fond.

Purple Finches are hardy birds and, if well fed, will live through rather severe winters. They bathe in brooks with the temperature below freezing point and some have been known to sing in the clearing weather directly after a blizzard. Nevertheless a few are overcome by starvation and cold, as occasionally one has been picked up from the snow helpless or dead. If well fed, some males may be heard singing more or less almost daily in mild seasons during the latter days of February. Purple Finches spend winter nights in dense evergreen trees or thickets, or even in some open building or under the shelter of a cupola roof.

Some of the wintering young males begin to show a little red in their plumage in March. Migrants from the south continue to arrive in Massachusetts through April and early May, and by apple-blossom time, or even before, some begin their courtship. The male in his nuptial antics, clad in his brightest, rosiest plumage, dances erect before the female, facing her with quivering wings fully extended, raised at an angle and vibrating so rapidly that they seem of gauzy texture, and with crown feathers erected, displaying his colors as he swings from side to side about her. Sometimes his excess of ardor carries him up into the air on fast-beating wings, pouring out either soft continuous twitterings or the full, loud, clear mating song, while she usually seems indifferent to his wooing. But if she is at all responsive he may drop down in front of her and they may touch bills time after time. If she grows more complaisant and flutters before him with open bill, their passion soon reaches its climax and the united pair fly away together. The wooing antics may occur on the ground, on top of a large rock, in a tree-top, or wherever the female happens to be.

The nest is built in most cases by the female, the male sometimes assisting. When the eggs are laid the mother bird incubates, while the male watches, feeds her and sings to her. Both parents feed the young, and when the young birds can fly well the family group begins its wanderings. In September and October there is a movement of the species out of the northern part of the range, and there is a general shifting about even in winter to places where food may be found in abundance.

The feeding of a flock in the trees usually is accompanied by a continuous sound of fluttering wings.

In spring and summer the Purple Finch feeds largely on insects, buds and blossoms; * in summer on insects and wild fruit, though it takes some cherries, blackberries and raspberries; in autumn and winter on wild fruits such as nightshade, juniper and black alder berries, on weed seeds, and also on seeds of trees (especially those of white pine and white ash), and the pulp or seeds of frosted crabapples and hawthorns. It is fond of the seeds of millet, hemp and sunflower, and has been known to eat dried currants and privet berries in winter. Professor Knight says that it seems "to relish the fruit of the dogwoods, elders and viburnums very much." [1] The stamens of the ash, red maple and elm are eaten by this bird. In spring it destroys the most succulent parts (stamens and pistils) of apple, cherry and peach blossoms, but this fruit tree pruning is not excessive, and, though sometimes viewed with alarm by the orchardist, has never been known to do material harm to the fruit crop. Mr. M. J. Magee shows a photograph of an apple tree that was frequented by many Purple Finches at blossoming time and another of the same tree in autumn so loaded with fruit that it was necessary to prop some limbs to prevent breaking.[2]

Economic Status. Many people become unduly alarmed at any habit of a bird which seems to promise a possible financial loss. The fruit grower has reason, however, for this attitude, as owing to the many inimical factors with which he must contend to assure success, his occupation requires constant vigilance; but he is likely to be too apprehensive of injury to his crop by the Purple Finch. The most extensive "raid" by these birds that has come to my notice occurred in New Jersey in March, 1915, when word was received that a small brown bird was "ferociously" devouring fruit buds in the large peach orchards, and that the proprietors were much agitated over the danger to the fruit crop. Mr. B. S. Bowdish, secretary of the New Jersey Audubon Society, sent me two stomachs of the depredators. Both contained sand; one, vegetable fiber, possibly that of buds, about 25 per cent, and weed seeds about 75 per cent; the other, vegetal fiber 10 per cent and weed seeds 70 per cent. The seeds were those of ragweed and smartweed. While the birds may have done some local damage, the New Jersey peach crop the following autumn was one of the largest and finest for years. The birds may have even helped the growers by thinning the crop somewhat so that the remaining buds produced larger fruit. From all available evidence the Purple Finch seems virtually harmless, except for its fondness for the seeds of a few garden plants, and its destruction of weed seeds and injurious insects should prejudice us in its favor, to say nothing of its song and beauty.

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* Dr. James B. Paige, of Amherst, Massachusetts, tells me that he saw a pair feeding on gall insects of the pin oak.

[1] Knight, O. W.: The Birds of Maine, 1908, p. 375.

[2] Wilson Bulletin, Vol. XXXVIII, 1926, pp. 167–169.

Lóxia curviróstra mínor (Brehm). Crossbill.

Other names: RED CROSSBILL; AMERICAN RED CROSSBILL.

Plate 64.

Description. — Bill fringilline, rather long for a sparrow, but quite convex, the rather elongated slender point of the upper mandible curved downward, and that of the lower curved upward, and both bent laterally so as to cross one another; nostrils concealed by a short ruff; form stout; head rather large, broad and flattened on top; wings rather long; tail short, sharply notched or forked; legs short, feet not large; a compact, stocky bird. *Adult male:* General color dull variable red, sometimes "varying from dull brownish-scarlet or almost orange-chrome in summer to a hue more or less approaching dragon's-blood-red in winter" (Ridgway); brightest on rump, dullest on back and scapulars, where obscured by dusky-brownish feather-centers, paling below, the under tail-coverts becoming whitish with dusky feather-centers; three dark, dusky-brownish marks on head in profile (often ill-defined and indistinct) as follows — a spot at base of jaw, another near top and back of head, and whole upper part of eye region; wings and tail black or blackish; wing linings grayish, usually with some reddish or pinkish feather-tips near edge of wing; bill horn-color, darkening at tips; iris brown; legs and feet very dark dusky-brownish. *Young male in first winter plumage:* Variable; often, in changing, a mottled mixture of greens, yellows and reds; some apparently resemble brightest adult females finally, and others appear much as adult winter males. *Adult female:* Similar in shape to male but differently colored, variable; prevailing color grayish-olive, more or less overlaid by bright yellowish-olive or even dull saffron; yellowish tint shows on rump and sometimes more or less below; more or less streaked or spotted with blackish, except on rump and part of upper tail-coverts; wings and tail not so dark as in male, more grayish. *Young female in first winter plumage:* Similar to adult winter female, but many show at first some buff tips on wing-coverts. *Young in juvenal plumage:* Variable; male, streaked above with olive-brown, edges of feathers white; wings and tail clove-brown, feathers faintly edged lighter buffy or greenish-buffy; below dull grayish-white, thickly streaked olive-brown; bill and feet olive-gray; female, darker than adult female; brown above, edges and tips of feathers gray; rump yellowish-white tinged greenish, a few feathers with dark centers; below dull ashy, lightening on abdomen, washed greenish across breast and streaked dark brown.

Measurements. — Length 5.50 to 6.40 in.; spread 10.00 to 10.75; folded wing 3.20 to 3.75; tail 1.85 to 2.17; bill .50 to .75; tarsus .58 to .70. Weight .75 oz. (C. L. Phillips). Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial molt (June to October) including body feathers but not wings or tail, these retained until first postnuptial molt; first breeding plumage the result of wear; at first postnuptial molt when bird is more than one year old, adult winter plumage presumably is assumed, though some birds may wear longer a dress similar to adult female; adults have only one (complete) postnuptial molt (July to November); breeding plumage results from wear; possibly several years may be required for assumption of highest plumage; when caged, adult males at their first molt assume a yellowish plumage similar to that of the female, but Mr. Outram Bangs tells me that when fed pine seed some birds again assume the red plumage.

Field Marks. — Song Sparrow size, but more robust, tail shorter. The only other species with *crossed bill* is the White-winged Crossbill which has two conspicuous white wing-bars while the Crossbill has none. *Male:* A bricky-red bird with carmine rump. *Female and young:* Tending toward grayish-olive, streaked with dusky; yellowish on rump and breast. Feeds mainly on coniferous trees (but sometimes on weeds) with parrot-like postures and movements; usually approachable; presence sometimes manifested by the noise made in opening cones of pitch-pine; flight undulating.

Voice. — Call note a *yip, kip, gyp* or *pip,* resembling in the distance the cry of a little chicken, often repeated like "*kip-kip*" or "*kip-kip-kip*"; a peculiar trill, between call-note and song, something like the

PLATE 64

PLATE 64

CROSSBILL

Page 14

Immature Male

Adult Male

Female

WHITE-WINGED CROSSBILL

Page 17

Immature Male

Adult Male

Female

Woodcock's song with his wing-quills (Napier Smith); song like "*too-tee too-tee, too-tee, tee, tee*" (R. Hoffmann); also a more elaborate flight-song; flock often indulges in a rather low chattering or twittering while feeding.

Breeding. — Commonly in coniferous forests. *Nest:* Usually rather low in thick foliage of coniferous tree, but sometimes quite high and in bare deciduous tree; built chiefly of twigs, rootlets and strips of bark, and lined with fine mosses and hair or fur, fine grasses and fine vegetal fibers, with sometimes a few feathers. *Eggs:* Usually 4 or 5; .73 to .85 by .52 to .59 in.; ovate to long ovate; pale greenish or greenish-blue spotted with various shades of brown and lavender, chiefly about large end; figured by E. A. Capen in "Oölogy of New England," Plate VIII, Figs. 1, 2. *Dates:* From mid-January to July, Maine. *Incubation:* Period probably 12 to 14 days; probably by female. May raise two broods at times, like the common Crossbill of Europe.

Range. — North America. Breeds from northwestern Mackenzie and north-central Ungava (Quebec) south to western Oregon, northern Montana, central Minnesota, Michigan, Pennsylvania, central Maryland (casually) and Long Island (casually) and in Appalachian Mountains south to northern Georgia; south in winter irregularly to Kansas, Louisiana and Florida; casual in Bermuda Islands.

Distribution in New England. — *Maine and New Hampshire:* Resident, irregularly abundant, occasionally scarce. *Vermont:* Very irregular at all seasons, breeds casually. *Massachusetts:* Winter visitor, occasionally common, but also occasional at all seasons. *Rhode Island and Connecticut:* Irregular winter visitor, occasionally common, casual at other seasons in Rhode Island.

Season in Massachusetts. — August to June 10, but has appeared in every month in the year, breeding casually.

Haunts and Habits. It is winter in the woods of the Pine Tree State. Broad the white mantle lies over field and farm, hill and dale. Every tuft and branch of spruce, pine and hemlock bears its fluffy burden of soft, pure snow crystals. All the air is misty with the driving snow. On distant hills the trees, no longer darkly green, stand white and ghost-like against the gray and lowering sky. The view is circumscribed by the thickening storm which shuts us into an ever-narrowing circle as daylight wanes. Despite the storm the happy, carefree Crossbills shake the snow in showers from each heavily laden tuft as they seek the cones from which they glean their sustenance — and so the twilight comes.

The handsome Red Crossbill is a strange, erratic, and seemingly irresponsible bird. In fact the bird seems a little "queer." It may start nesting either in January or in midsummer, placing the nest in a dense coniferous tree or on a bare leafless limb. It may pass one winter in the forests of the frozen north, and the next it may be found in the sunny south. Having had a taste of a milder climate it may give up all idea of nesting in the far north and carelessly remain away from the country of its nativity for a whole season. In a region where its native food is scarce, it will try almost anything else that is edible. Salt, which is anathema to many birds, seems rather to please the Crossbill, as it eats almost anything that is well salted. The bird, however, may not be such a happy-go-lucky individual as it seems. The migration of the species, especially when the birds move south in large numbers in winter, probably is caused by a lack of their favorite food in their usual winter habitat, or by very deep snow which cuts off their supply of grit, which is necessary to aid digestion. Their extremely erratic breeding dates may be due to an abundance of some favorite food at these times in the region in which the birds

happen to be. If in a certain season, for example, seeds of coniferous trees and wild fruits are very abundant in the Maine woods, we may expect great numbers of Crossbills to breed there, particularly if a dearth of such food prevails farther north. The next season with opposite conditions hardly a Crossbill will be found in these woods. These contrasting conditions were found in the seasons of 1922 and 1923. In the summer of 1922 there were quantities of spruce cones in the woods of northern Maine, and vast numbers of Crossbills and White-winged Crossbills summered there as well as in other parts of northern New England where similar food was abundant. The next year with a comparative scarcity of spruce seeds, hardly a crossbill of either species could be found in the same region.

Crossbills normally are absolutely unsuspicious. I have lain on the ground under a tree watching Crossbills feeding among the low branches only a few feet away, and they completely disregarded my presence. It is extremely interesting to watch their feeding habits. The peculiar bill seems a poor tool for picking out seeds, but the birds use it largely for wrenching off the scales from the cones, and then pick out the seeds with their tongues. They climb about among the twigs and sprays like little parrots, using both bills and feet. A Crossbill may hang easily by its beak, or by one foot while reaching with the other, and an individual when suddenly frightened may swing underneath a twig and hang there head downward, where, partially concealed by the foliage, he might be mistaken for a cone. If thoroughly alarmed, Crossbills may fly to a considerable distance, but if the tree from which they are frightened contains considerable food not available near-by, they will come back. When not particularly hungry and engaged in song, they like a tall tree-top. On the Pacific coast I have seen males singing on tree-tops 170 and 180 feet above the ground.

Not much is known about the breeding of the Crossbill in New England. Mr. Napier Smith, writing to me from Magog, Quebec, in 1921, said that after fifteen days in the nest some young were able to fly on April 25. There is one case on record where a female, taken off her nest by a collector, came back and sat on her eggs after he had removed the nest from the tree and while he was descending and holding the nest in his hand.[1]

Crossbills commonly move south more or less in winter. Some may be found on Cape Cod nearly every year, but in certain seasons they are almost unknown, and in others abundant. While with us, they frequent pitch pines, many of which grow on the sandy lands of Cape Cod and the Elizabeth Islands, and so those regions are favorite resorts for Crossbills. Occasionally the birds remain very late, and summer invasions have occurred rarely. While here in winter they are always attracted to fruiting larches or spruces growing on lawns, and will frequent such trees until the cones are stripped of seeds.

Crossbills, though specialized for feeding on the seeds of cones, are by no means confined to such food. They feed on the seeds of white pine, pitch pine, Norway and native spruces, balsam fir, larch, hemlock, ailanthus, maple and elm, beechnuts, seeds of sunflower, dandelion, evening primrose and other weeds, the buds of a number of coniferous

[1] Baird, Brewer and Ridgway: A History of North American Birds, Land Birds, Vol. 1, 1905, pp. 487, 488.

trees, and some wild fruit, including that of the sweet gum. In late spring and summer they eat insects such as gall-insects, ants, plant-lice and caterpillars of various species, but their food has not been carefully studied. They sometimes pick up a little grain from the ground by turning the head to one side, but in New England they rarely frequent agricultural regions while grain is still standing. Years ago New Jersey peach growers were alarmed at the appearance of flocks of strange birds that were devouring the hard, young peaches. Crossbills were the culprits, but they soon passed on, having casually sampled the peach crop while on their way somewhere.

Economic Status. Crossbills are of little economic importance. They have been known to eat the heads of oats in the field, but they rarely destroy any product of agriculture, and undoubtedly perform some service by devouring many insect enemies of forest trees.

Loxia curvirostra pércna Bent. Newfoundland Crossbill.

Description. — Similar to Crossbill, but considerably larger, with a much larger and heavier bill, heavier and stronger legs and feet, and generally darker than any other American race of the Crossbill, "red deeper and more brilliant and greenish-yellow richer and brighter."

Measurements. — Folded wing 3.37 to 3.80 in.; tail 2.16 to 2.42; bill .64 to .75; tarsus .60 to .73. Weight one ounce, or near it (C. L. Phillips).

Molts. — Probably like those of Crossbill.

Field Marks and Voice. — Difficult to distinguish from those of Crossbill.

Breeding. — Unknown.

Range. — Not well known. Breeds in Newfoundland; in winter south and west to Rhode Island.

Distribution in New England. — Records: *Massachusetts:* Chatham, November 30, 1919, two males taken, and December 16, 1919, two males and one female taken, specimens sent to Arthur C. Bent and now in his collection in Museum of Comparative Zoölogy, Cambridge, Massachusetts;[1] December 18, 1919, two pairs taken by B. E. Bassett, now in collection of Charles L. Phillips;[2] January 21, 1920, three males taken and sent to Arthur C. Bent;[3] Hingham, February 19, 1920, male received from Lenora MacComisky by Boston Society of Natural History, and now in the collection of that society. *Rhode Island:* Westerly, November 16, 1919, two taken; Davisville, November 22, 1919, male and female taken, all by Harry S. Hathaway.[4]

Haunts and Habits. This race of the Crossbill seems to have similar habits to those of the more common bird. In New England it frequents the same localities, and feeds on the same food. Mr. Harry S. Hathaway says that the birds of this race that he saw in Rhode Island were far more wild than the common Crossbill, and that their calls seemed much louder. They were easily alarmed in all cases, and difficult to approach.

Loxia leucóptera Gmelin. White-winged Crossbill.

Plate 64.

Description. — Similar in shape and size to Red Crossbill, but a little larger and bill thinner, colors very variable. *Adult male:* Rose-red or light carmine, sometimes approaching crimson, occasionally nearing orange-red or even orange-yellowish, and passing into grayish or whitish on sides and flanks, the

[1] Bent, Arthur C.: Auk, Vol. XXXVII, 1920, p. 298 and *in litt.*
[2] Phillips, Charles L.: *in litt.*
[3] Bent, Arthur C.: Auk, Vol. XXXVII, 1920, p. 298 and *in litt.*
[4] Hathaway, Harry S.: *in litt.*

latter shaded dusky; scapulars, outer upper tail-coverts, wings and tail black or blackish, the black sometimes extending more or less across back which is often streaked dusky; wings with two broad white bars, and tertials tipped white; some touches of dusky in region of eye and ear; nasal tufts pale grayish to nearly buffy; under tail-coverts black, bordered white; wing linings chiefly dusky and whitish mixed; bill dusky; iris brown; legs and feet dark or dusky-brown. *Young male in first winter plumage:* Resembling adult male, but red largely replaced by yellow, mixed with dashes of dull red; forehead and sides of head usually more or less blackish; top of head, back of neck, back and under plumage more or less streaked blackish; wings and tail as in juvenal. *Adult female:* Above olive-greenish or grayish, streaked with dusky feather-centers, becoming olive-yellowish on top of head, and clear yellow on rump; wings and tail much as in adult male, but duller; scapulars with dusky centers and grayish edges. *Young female in first winter plumage:* Lacks red of male and resembles adult female. *Young in juvenal plumage:* Dull grayish-white, thickly streaked with clove-brown, feathers edged with buffy feather-edges and two buffy-white wing-bars; bill and feet brown.

Measurements. — Length 6.00 to 6.75 in.; spread 9.20 to 10.70; folded wing 3.05 to 3.50; tail 2.30 to 2.60; bill .62 to .70; tarsus .55 to .65. Female somewhat smaller than male.

Molts. — Sequence of molts and plumages same as in Red Crossbill (see page 14).

Field Marks. — Size of Song Sparrow but more robust, with shorter, forked tail. *Adult male:* Rose-red, with black wings and tail and two broad white wing-bars. *Female and young:* Wings and tail similar to those of male, but brownish, tinged in places with olive-green; rump yellow; distinguished from Red Crossbill and all other New England birds of same size by breadth of white wing-bars.

Voice. — Call, a single *cheep, peet* or *week,* "a loud whistled *wheet, wheet, wheet*"; a rolling twitter somewhat like corresponding note of Redpoll (G. H. Thayer); song, a very fine loud series of whistles, trills and twitters, somewhat resembling that of American Goldfinch.

Breeding. — In coniferous forests. *Nest:* In thick mass of foliage of coniferous tree, from 10 to 12 feet from ground, built of spruce twigs and lichens, or shreds of bark, lined with fine grass and feathers or hair. *Eggs:* Usually 2 to 4; .77 to .86 by .56 to .61 in.; ovate; variable, pale bluish-green to nearly white, with spots or blotches and sometimes lines of various browns and lavenders, chiefly about large end; figured by Henry Seebohm in "A History of British Birds," 1885, Plate 19. *Dates:* Mid-January to August; April seems a favorite month in Labrador and the Northwest Territory. *Incubation:* No information.

Range. — Northern North America. Breeds from tree limit in northern Alaska, northern Mackenzie, southern Keewatin, northern Ungava (Quebec) and southern and eastern Greenland south to northern Washington, northwestern Montana, central Manitoba, northern Michigan, south-central Ontario, northern New York, central New Hampshire, southern Maine and southern Nova Scotia; in winter from the northern part of its breeding area south to Oregon, Nevada, Colorado, Kansas, Missouri, southern Illinois, southern Indiana, southern Ohio, southern Pennsylvania, District of Columbia and North Carolina; accidental in England.

Distribution in New England. — *Maine:* Uncommon to common resident, irregular and chiefly in northern part; otherwise irregular visitor. *New Hampshire:* Uncommon resident at higher elevations in White Mountains; elsewhere irregular visitor. *Vermont:* Casual summer resident on higher peaks; otherwise irregular visitor. *Massachusetts:* Irregular winter visitor, usually rare, but more common in some seasons. *Rhode Island and Connecticut:* Rare irregular winter visitor.

Season in Massachusetts. — October 22 to May 25 (June 4, 13).

Haunts and Habits. The White-winged Crossbill, like the preceding species, is a bird of coniferous forests, leaving them only when food is scarce in its favorite regions. Its distribution is slightly more northern than that of the Red Crossbill, and it does not go far south in its irregular migrations. Therefore it is much more rare in southern

New England than the other species, although at intervals it may visit the section in very large numbers, as was the case in the winter of 1868–69.

In my youth, much time was spent unsuccessfully in searching for this bird about Worcester, Massachusetts. One bright morning, however, a pair appeared, feeding on weed seeds by the roadside in front of a neighbor's house, the last place I would have looked for them. Like the Red Crossbill this species keeps mostly in flocks at all seasons of the year. The male leaves the flock to feed the female on the nest, feeding her as the young are fed, by regurgitation. Having fed her he flies in wide circles above her, pouring forth an ecstatic song.

The habits of this bird are much like those of the preceding species, and it partakes of similar food, which consists largely of buds and the seeds of trees, shrubs and weeds and many berries and insects; but it seems to prefer the seeds of the Norway spruce and hemlock to those of the pitch pine, and is more likely to be found where these trees are grown on cultivated grounds than in the wild pitch pine lands much frequented by the Crossbill.

Economic Status. In spring this bird feeds more or less on insects, but its economic status is unknown.

Acánthis hórnemanni exílipes (Coues). Hoary Redpoll.

Other name: coues' redpoll.

Plate 65.

Description. — Bill small, short, conic, deep at base, its outlines nearly straight; nasal tufts heavy, sometimes reaching half length of bill; wings longer than tail; tail rather long for a finch and sharply forked; feet small and weak. *Adult male in nuptial plumage:* Above chiefly grayish-white with narrow dusky spots and streaks; nasal tufts light grayish-brown; forehead grayish, finely mottled with dusky; top of head crimson; *lower back and rump white,* often tinged pinkish; upper tail-coverts white, their feathers with dusky centers; wings and tail dusky, their feathers edged and tipped whitish, sometimes yellowish on edges of inner secondaries and first tertials, and light edges broader on tertials; broad grayish or white tips of greater and middle wing-coverts forming two light wing-bars; lores and a large spot on chin and upper throat dusky; sides of head largely white, cheeks whiter than in common Redpoll; below generally white, upper breast washed rose-pink (in some adult males pink entirely wanting), sides and flanks usually unmarked; wing linings mainly white with darker markings on outer edges; bill largely or wholly dusky; legs and feet black. *Adult male in winter plumage:* Similar, but head, neck, back and scapulars tinged pale buffy (more or less), bright edgings of wings and tail broader, and bill largely yellowish with dusky tip (and sometimes dusky edges). *Adult female in nuptial plumage:* Similar to adult male in same, but without pink on breast or rump, and with some tendency to streaking on sides and flanks. *Adult female in winter plumage:* Like adult male in winter, but tinged more with buffy about head and back, light edgings of wings and tail broader, and bill largely yellow. *Young in first winter plumage:* Similar to adult female. *Young in juvenal plumage:* Generally whitish or grayish-white (whiter below), streaked with dark grayish-brown, most heavily on top of head, back of neck, back and scapulars, cheeks and ear region; ear region and feather-edges of back and scapulars buff or dull tawny-brown; wing-bars and tertials edged buffy; black shaft-streaks on front and sides of neck; legs and feet pale to dark horn-color; otherwise much like adult female, but no red on top of head.

Measurements. — Length 4.50 to 5.50 in.; spread about 9.00; folded wing 2.95 to 3.10; tail 2.35 to 2.85; bill .30 to .38; tarsus .54 to .70.

Molts. — Probably similar to those of Redpoll (see page 21).

Field Marks. — Size of Chipping Sparrow, or slightly larger. *Male:* A gray and white bird narrowly streaked dusky, top of head red, breast pink and rump white; at close range may be distinguished from common Redpoll by its *whiter* appearance, white unstriped rump and white lower plumage. *Female and young:* Similar but show no pink.

Voice. — Said to be much sharper than that of common Redpoll.

Breeding. — Similar to that of other redpolls, in coniferous forests or dwarfed trees or in shrubby lands. *Nest:* In tree or bush from 2 to 10 feet up, built of grass chiefly, fine twigs and moss, and lined with plant down and occasionally a few feathers. *Eggs:* 4 to 6; about .65 to .75 by .50 to .60 in.; elongate ovate to short ovate; very variable, dull "greenish-blue" to "pale nile blue" with spots, dots and scrawls of vinaceous, lavender, chocolate and dark blackish-brown (near black), all tending to form a wreath at large end, some covered with fine brown specks. *Dates:* Mid-June to July 20, northern Canada. *Incubation:* Period unknown. One brood yearly.

Range. — Northern North America, Europe and Asia. Breeds from northern Alaska to northern Ungava (Quebec), and from Lapland and northern Russia to northeastern Siberia, south to western Alaska, northern Manitoba, and elsewhere to about the southern edge of the Barren Grounds; winters from its breeding range south more or less irregularly to southern British Columbia, Montana, Colorado, southern Illinois, northern Michigan, southern Ontario, New York and Connecticut, and in the Eastern Hemisphere to the British Isles, eastern Prussia and northern Japan.

Distribution in New England. — Rare winter visitor; not recorded in Rhode Island. Records: *Maine:* Westbrook, January 26, 1896, an apparently immature female taken by Arthur H. Norton;[1] February 14, 1909, an adult male collected by Arthur H. Norton;[2] Norway, December 25, 1913, two seen by Freeland Howe, Jr.[3] *New Hampshire:* Hampton (?), Ned Dearborn reports a specimen in the collection of A. S. A. Shaw, of Hampton, date and place of capture not given.[4] *Vermont:* Wells River, a bird banded on March 6, 1926, by Wendell P. Smith.[5] *Massachusetts:* Howe and Allen cite ten early records;[6] others are: Ipswich, December 29, 1910, a bird seen by Barron Brainerd and James L. Peters;[7] Roslindale, January 1, 1917, eight birds seen by Mrs. U. C. Sherman;[8] Cohasset, January 12, 1920, two seen by Dr. John B. May.[9] *Connecticut:* East Haven, November 24, 1906, an adult female taken by L. B. Bishop.[10]

Season in Massachusetts. — November 15 to March 20.

Haunts and Habits. The Hoary Redpoll, called "Coues' Redpoll" by British ornithologists, is a bird that I never knowingly have seen alive. In haunts, habits and food it resembles the common Redpoll, and is close to it in size. Probably it is much less rare in New England in winter, however, than would appear from the few known records. A few of these birds in a flock of Redpolls would hardly attract notice, except at very close range, and under the most favorable circumstances. But if all such flocks were scanned carefully with a good glass while perched, it should not be very difficult to discover any Hoary Redpolls that might be among them, because of the whiter appearance

[1] Proceedings, Portland Society of Natural History, Vol. II, 1897, p. 104.
[2] Auk, Vol. XXVI, 1909, p. 308.
[3] Bird-Lore, Vol. XVI, 1914, p. 27.
[4] Dearborn, Ned: The Birds of Durham and Vicinity, 1903, p. 70.
[5] Smith, Wendell P.: *in litt.*
[6] Howe, R. H., Jr., and Allen, G. M.: Birds of Massachusetts, 1901, pp. 129, 130.
[7] Bird-Lore, Vol. XIII, 1911, p. 20.
[8] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. IX, p. 16.
[9] May, John B.: *in litt.*
[10] Sage, John H., Bishop, L. B., and Bliss, W. P.: Birds of Connecticut, 1913, p. 120.

PLATE 65

PLATE 65

REDPOLL
Page 21

HOLBÖLL'S REDPOLL
Page 23

FEMALE

ADULT MALE

ADULT MALE

HOARY REDPOLL
Page 19

GREATER REDPOLL
Page 24

ADULT MALE

ADULT MALE

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of the latter. This is one of the birds, however, of which we get almost no sight records in New England, though Mr. George H. Boardman reported it years ago in far eastern Maine.

ECONOMIC STATUS. See page 23.

Acanthis línária linaria (LINNÆUS). **Redpoll.**

Other names: MEALY REDPOLL; LESSER REDPOLL.

Plate 65.

DESCRIPTION. — Near size and shape of Hoary Redpoll, but wing and tail (especially tail) averaging shorter, bill and toes proportionately longer, bill more acute; coloring much darker, rump not white but streaked dusky, as are also under tail-coverts. *Adult male in nuptial plumage:* Narrowly dusky on front of forehead; nasal feathering and lores same; top of head bright glossy poppy-red or crimson; rest of upper plumage chiefly dark grayish-brown, rather indistinctly streaked with darker or dusky and some grayish-white; upper tail-coverts dark grayish-brown, rather narrowly edged much paler; wings and tail dark or dusky grayish-brown; wings with the usual two grayish-white wing-bars often very narrow or obsolete; flight-feathers and tail-feathers edged with paler or grayish-white; from eye region down to upper breast (excepting dusky chin and upper throat) suffused with pink, sometimes more rosy (this tint is said to disappear during the breeding season, leaving the male in plumage similar to female); elsewhere below white, sides, flanks and under tail-coverts broadly streaked dusky; wing linings mostly grayish-white with darker feathers near bend; bill horn-color, darker at tip; iris brown; legs and feet blackish or brownish-black. *Adult male in winter plumage:* Much lighter colored than in breeding plumage with more or less buffy tinge in upper plumage and more distinctly streaked; often some pink on lower rump; the pink of fore parts paler; bill chiefly yellow, darkening at tip, also often along edges and sometimes on ridge both above and below. *Young male in first winter and first nuptial plumage:* Like adult female but usually browner above, more strongly tinged buffy below, with some trace of pink on rump and cheeks, and often same on breast; as breeding season approaches much of the buff becomes lighter or whitish. *Adult female (and some apparently adult males):* Similar to adult male, but red on crown not quite so intense; pink wanting on cheeks, upper breast and (usually) on rump, the pink being replaced by pale buffy or whitish; dusky of chin and upper throat extending farther down than in male. *Young female in first winter and first nuptial plumage:* Similar to young winter male, but like adult female rarely showing any pink. *Young in juvenal plumage (sexes alike):* Streaked like juvenal Hoary Redpoll but a trifle less grayish; no red cap; white on top of head and on back and belly not so pure.

MEASUREMENTS. — Length 4.50 to 5.50 in.; spread 8.20 to 8.80; folded wing 2.75 to 3.10; tail 2.20 to 2.70; bill .35 to .45; tarsus .55 to .60. Female smaller than male.

MOLTS. — Juvenal plumage largely acquired in nestling by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September) including body feathers, most of wing-coverts, and in some cases tertials, but not flight-feathers nor tail; first nuptial plumage results from abrasion; probably most immature birds become as adults in winter plumage after first postnuptial molt, when more than one year old; adults acquire winter plumage by complete postnuptial molt in autumn, though some few males may never acquire the pink on rump and fore parts, it being replaced by yellowish, as in caged redpolls.

FIELD MARKS. — Size of Chipping Sparrow. *Adult male:* Red cap and blackish chin; above grayish-brown, darkly streaked; two light wing-bars; whitish below; breast and rump pink. *Female and young:* Similar, but little or no pink. In calls, size and flight they resemble Goldfinches, but their flight calls commonly are more rattling. See also *Field Marks* under Hoary Redpoll (page 20) and Greater Redpoll (page 24).

Voice. — Feeding call a peculiar *chett* or *chett-cherrett* (H. Nehrling); common call a rough *chug* or *chee*, somewhat like call of White-winged Crossbill; also a Goldfinch-like note *deé-ar;* song, a string of *chugs* interspersed with *deé-ars* and *chee-chee-chees*, and now and then a fine rattling trill (Townsend and Allen); a long buzz resembling one note of Pine Siskin but longer and thinner.

Breeding. — In birch and spruce forests, willow or alder thickets, or in bushy and grassy lands or tundra in the far north. *Nest:* Usually low in bush or tree, more rarely in hollow log or stump, or in a tussock of grass; built of any available material, twigs, grass, feathers, plant down, rootlets, moss, catkins, etc., and warmly lined with plant down, feathers or hair. *Eggs:* 4 to 7, usually 5 or 6; .65 to .68 by .48 to .58 in.; probably usually indistinguishable in color (sometimes more blue) from those of Hoary Redpoll (see page 20), but average smaller; figured by Henry Seebohm in "A History of British Birds," 1885, Plate 12. *Dates:* Late May to August, Arctic America; June the most prolific month. *Incubation:* No details. One brood yearly, possibly sometimes two.

Range. — Boreal and Temperate regions of Northern Hemisphere. Breeds in Boreal zones north to and even beyond tree limit, in northwestern Alaska, northern Yukon, northern Mackenzie, southern Keewatin, northern Ungava (Quebec) and Newfoundland south to northern British Columbia, northern Alberta, northern Manitoba, north-central Quebec, islands in Gulf of St. Lawrence and southern Newfoundland; winters from northern Alaska and northern Ungava south to Lassen County (California), southeastern Oregon, northern Colorado, northern Oklahoma, Missouri, northern Alabama (casually), Tennessee and central-eastern North Carolina; in the Old World, northern Europe north to Lapland; south in winter over the greater part of Europe and parts of central Asia.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Winter visitor of irregular abundance. *Massachusetts, Rhode Island and Connecticut:* Irregularly common winter visitor.

Season in Massachusetts. — October 16 to April 25.

Haunts and Habits. This little northern wanderer appears rather irregularly in southern New England. It drifts into northern New England every winter in considerable numbers, but in many winters it is rare in Massachusetts, Rhode Island and Connecticut. It appears here in companies varying from small groups to flocks of hundreds, frequenting old fields, pastures and swamps where birches or alders grow, and often feeding in patches of weeds about farms and villages. As the flocks may be found not infrequently also among pines and other coniferous trees, one who is often abroad in winter can hardly fail to see them.

They come with the snowflakes out of the dun sky of November and leave as spring approaches. They are such hardy, boreal birds that probably they leave the northern wilderness in great numbers only when driven south by lack of food. As they are near the size of Goldfinches and resemble them in their undulatory flight it is difficult to discriminate between the two species at a distance, but on nearer approach the pink on the breasts of the males, their blackish chins and their red caps distinguish them at once from either Goldfinches or Pine Siskins.

Often they flock in company with one or the other of the last two species, but when by themselves they are extremely unsuspicious of persons. Mr. E. O. Grant says that on March 23, 1926, he saw a farmer near Patten, Maine, sitting on a snow drift about fifteen feet high, surrounded by about a hundred Redpolls. Some of them at times perched on his head and shoulders, and one sat on his knee for about a minute. The farmer said that he had enjoyed the previous half-hour more than any other

that he could remember and that any man who would kill one of those little birds ought to be sent to the "pen." The birds had been attracted by seed scattered on the snow in unloading hay.

The feeding flocks may be startled by any sudden noise or violent movement. Then they rise and wheel in concert, but after going through their usual evolutions they may return to the very place from which they took flight. In winter they spend most of the brief days in searching for food and in consuming it, and at night they may retire to some dark thicket of coniferous trees to sleep. I have never heard any song from this species, but their lay is said to resemble that of the Goldfinch.

The food of the Redpolls while with us consists largely of the seeds of birches and alders and those of common grasses and weeds. At feeding stations they eat greedily the seeds of sunflowers, millet and hemp, also hayseed and "rolled oats." They take seeds of pines, elms and lindens and the buds of various trees and shrubs, including those of the larch and lilac. During the brief summer in their northern homes they feed largely on insects. Dr. Jared P. Kirtland informed Dr. T. M. Brewer that a male of this species, kept in a greenhouse, was so assiduous in the pursuit of plant-lice that it was not necessary to fumigate the plants, and that after the bird discovered these aphids it took no other food. While the bird was confined, a female Redpoll was seen hovering over the greenhouse and she remained near-by all winter. When the male finally escaped the faithful mate rejoined him.[1]

Economic Status. Redpolls seem to be of little economic importance in New England.

Acanthis linaria hólbœlli (Brehm). **Holböll's Redpoll.**

Plate 65.

Description. — Like common Redpoll but averaging larger, the bill especially larger and also usually relatively longer, with straight sides and slightly curved ridge (Coues).

Measurements. — Length 5.00 to 5.25 in.; folded wing 2.85 to 3.00; tail 2.25 to 2.50; bill .35 to .43. Female smaller than male.

Molts. — Similar to those of common Redpoll (see page 21).

Field Marks. — None to be relied upon; cannot be distinguished from Redpoll in the field.

Voice. — Similar to that of Redpoll.

Breeding. — Near sea-coast. *Nest and Eggs:* Indistinguishable from those of common Redpoll.

Range. — Northern parts of the world. Breeds on Herschel and other Arctic islands south to the Commander Islands, Kamchatka; migrates through Alaska south and east in winter to southeastern Montana, Iowa, Illinois, southern Quebec, Ontario, southern New York, Massachusetts and Maine; in the Old World south in winter to the British Isles, Holland, Germany, Austria, Hungary, Russia, central Asia and Japan.

Distribution in New England. — Records: *Maine:* North Bridgton, November 25, 1878, a male taken by James C. Mead;[2] Gorham, February 3, 1903, female taken by Arthur H. Norton.[3] *Massa-*

[1] Baird, Brewer and Ridgway: A History of North American Birds, Land Birds, Vol. I, 1874, p. 497.

[2] Maine Sportsman, April, 1897, p. 6; Knight, O. W.: Birds of Maine, 1908, p. 384.

[3] Journal, Maine Ornithological Society, Vol. VI, 1904, p. 5; Knight, O. W.: Birds of Maine, 1908, p. 384.

chusetts: Swampscott, March 26, 1883, two males shot by William Brewster, now in collection of Boston Society of Natural History;[1] Lexington, March 10, 1890, a female taken by Dr. Walter Faxon.[2]

Season in Massachusetts. — November 15 to March 20.

Note. This subspecies, if such it really should be called, is virtually indistinguishable from the common Redpoll, except by its larger bill. As it appears to breed, in part, in the same region as the former, its larger bill and average larger size may be due to individual variation. Professor Ora W. Knight considered it probably an intermediate between the common Redpoll and the Greater Redpoll. It is found in company with the common species, frequents the same localities and partakes of the same food. The ordinary observer has no chance to distinguish it in the field.

Economic Status. Unknown.

Acanthis linaria rostráta (Coues). Greater Redpoll.

Plate 65.

Description. — Similar to common Redpoll except for much larger size, and to Holböll's Redpoll, except for larger size and relatively thicker, shorter, more obtuse bill; also rather darker and browner with dusky stripes on sides and flanks usually heavier and broader. *Adult male:* Pink tints apparently less intense and less extensive than in *A. l. holbælli* (Ridgway).

Measurements. — Length about 6.00 in.; folded wing 2.95 to 3.30; tail 2.35 to 2.70; bill .33 to .42; tarsus .60 to .70. Female smaller than male.

Molts. — Similar to those of Redpoll (see page 21).

Field Marks. — Similar to Redpoll but so much larger (and usually darker) that when seen with Redpolls it may be readily distinguished by a careful observer.

Voice. — Similar to that of Redpoll.

Breeding. — In Arctic thickets. *Nest:* In low bushes. *Eggs:* Indistinguishable in color and shape from those of common Redpoll, but larger.

Range. — Northern parts of North America. Breeds in Greenland where resident; winters south through Manitoba, Ungava and Quebec to southeastern Montana, Colorado, southeastern Iowa, northern Illinois, northern Indiana, southern Ontario, southern New York and Connecticut; in the Old World to Scotland and Ireland.

Distribution in New England. — Irregular and erratic winter visitor; sometimes abundant in Maine; less common in New Hampshire; not recorded from Vermont; uncommon to rare in southern New England; appears most commonly on coastal plain.

Season in Massachusetts. — November 25 to March 14.

Haunts and Habits. The Greater Redpoll is rather rare in New England, except along the seaboard where in certain winters it appears more or less with the common Redpoll. It visits the same localities as the latter, and its food and habits seem not to differ materially from those of its smaller companions. While it visits New England rather irregularly, it probably occurs here in greater numbers than the records indicate, as only close inspection of the winter flocks of Redpolls will enable one to discover its presence.

Economic Status. See page 23.

[1] Brewster, William: Auk, Vol. IV, 1887, p. 163.

[2] Brewster, William: Minot's Land-Birds and Game-Birds of New England, 2nd ed., 1895, p. 472; Howe and Allen: Birds of Massachusetts, 1901, p. 129.

PLATE 66

PLATE 66

GOLDFINCH

Page 25

Male in Winter

PINE SISKIN

Page 29

Adult

Male in Summer

Female in Summer

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Note. The following quotation from Mr. William Brewster is self-explanatory.

"**Acanthis brewsterii** (Ridgw.). Brewster's Linnet. On the morning of November 1, 1870, as I was looking for Woodcock in the Warren Run, Waltham (about half a mile to the southwestward of the Waverly Oaks), a large number of Redpolls alighted in the top of a gray birch near at hand and began picking the fruiting catkins to pieces to obtain the seeds. After watching them for a few moments I fired into the flock, killing seven birds, six of which proved to be typical *A. linaria*. The seventh lacked all traces of red on the crown and of dusky on the chin. As its general coloring was not unlike that of a Pine Linnet I supposed at the time that it was merely an aberrant example of that species, but Mr. Robert Ridgway, on examining it a year or two later, pronounced it to be a variety of the Twite or Mountain Linnet of Europe and named it *Ægiothus* (*flavirostris* var.) *Brewsterii*. In his 'Birds of North and Middle America,' where he gives it as a full species under the name *Acanthis brewsterii*, he says that 'possibly it is a hybrid of *Acanthis linaria* and *Spinus pinus*.' I made the same suggestion more than twenty years ago, and it has since derived added probability from the fact that the bird continues to be known only from the type specimen, which is still in my collection." [1]

Astragalinus tristis tristis (Linnæus). Goldfinch.

Other names: THISTLE-BIRD; YELLOW-BIRD; WILD CANARY.

Plate 66.

Description. — Bill similar to that of Greater Redpoll, shorter than that of Pine Siskin; proportions of wings and tail as in redpolls. *Adult male in breeding plumage:* General color bright lemon-yellow; lores, forehead and crown and greater part of wings and tail black; tail-coverts, middle wing-coverts (and sometimes lesser wing-coverts, which are usually yellow), tips of greater coverts, and parts of edges and ends of flight-feathers and tail-feathers, white; inner webs of tail-feathers dusky, whitening toward tips; feathers of tibia white; wing linings mainly white; bill yellow-orange or orange-yellow, its ridge blackening toward tip; iris brown; legs and feet light brown. *Adult male in winter plumage:* Similar to breeding female, but scapulars darker, *lesser wing-coverts yellow*, and wings and tail chiefly deep black and marked as in summer, but white markings broader. *Young male in first breeding plumage:* Similar to adult male, but lesser wing-coverts brownish or olive instead of yellow. *Young male in first winter plumage:* Similar to young in juvenal plumage, but not yellow below (except chin), where "pale olive-gray" darkest on throat; sides tinged brown; middle of belly, region about vent, and under tail-coverts white; lesser wing-coverts brownish with a greenish tinge but *not yellow*. *Adult female in breeding plumage:* Above mostly olive-brownish or grayish with a tinge of yellowish, especially on scapulars and rump; upper tail-coverts whitish or pale grayish; no black cap; wings and tail marked much as in male, but dusky rather than black, and lacking yellow on lesser coverts; below dull grayish, more or less tinged with yellow, especially on throat, sides and flanks; sometimes quite yellowish except on under tail-coverts (which are white); belly lighter; wing linings mostly light grayish or whitish; bill yellowish or horn-color, darkening toward tip; iris brown; legs and feet brownish. *Adult female in winter plumage:* Similar to female in summer, but browner, less yellowish, and white markings of wings and tail broader and tinged more or less buffy and brownish. *Young in juvenal plumage:* Resemble winter adults in pattern but browner, wings and tail black in male, browner in female, and some or all of light wing and tail markings usually fawn-color or tawny; forehead, sides of head and lower plumage tawny, yellow or yellowish; "bill and feet pinkish-buff, becoming dusky with age" (J. Dwight).

Note. Mr. C. L. Whittle has handed me the following original observations: "Living male Goldfinches in first winter plumage have yellowish-brown lesser coverts with a marked greenish cast. Such birds in their second winter plumage have in life the lesser coverts of bright lemon-yellow, and the median

[1] Brewster, William: Memoirs of the Nuttall Ornithological Club, No. IV, Birds of the Cambridge Region, 1906, pp. 260, 261.

coverts of a 'dark mouse-gray' color, with soiled white or 'pallid mouse-gray' tips, sometimes with traces of yellow. Still older males have in the winter season bright lemon-yellow lesser coverts and also lemon-yellow tips to the median coverts, involving nearly the whole of the 'soiled white' portion of the feathers. At the same time the dark mouse-gray color of the feathers has increased in depth of color becoming 'blackish-mouse-gray.' Such old males, therefore, have a considerably larger area of lemon-yellow than those known to be in second winter plumage. If one inspects a flock of Goldfinches feeding close by, it is usually quite easy to pick out such old males since the overlapping feathers of the side of the lower neck, which generally effectively conceal the lesser coverts alone when the bird is at rest, are usually insufficient to hide the larger patch of yellow. Not only so, but such old birds have, in addition to the marked yellowness of the throat and sides of the head, a generally greater yellowness (of course excluding the rectrices and flight-feathers) than younger males.

"The details of the plumage changes above referred to in some detail have been worked out by collecting and mounting feathers from the median coverts of male birds in the three stages mentioned. The increasing blackness of the median coverts with age is easily observed, but the change from the soiled white tips of the median coverts to yellow tips appears now to be variable, since occasional males in second winter plumage have traces of yellow on the tips of the feathers. It is, however, thought probable that old males having the tips of the median coverts most uniformly yellow are in their third winter plumage, and this thought is strengthened by the rather infrequent occurrence of such birds."

Measurements. — Length 4.45 to 6.00 in.; spread 8.70 to 9.05; folded wing 2.60 to 3.00; tail 1.60 to 2.10; bill .42 to .50; tarsus .46 to .57. Weight nearly .50 oz. (B. H. Warren); average 14.50 grams (.51 oz.) (C. L. Whittle). Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt, completed after young bird leaves nest; first winter plumage by partial molt of body feathers only (September, October); first breeding plumage (producing black cap in male) follows partial prenuptial molt (April, May) including all body plumage but not wings or tail; after complete postnuptial molt (September, October) adult winter plumage is assumed, in which male has yellow lesser wing-coverts; adult breeding plumage is assumed the following spring by a prenuptial molt involving entire body plumage, but not wings or tail on which the white edges become narrower (by wear) than in winter; in some cases wings become almost entirely black; molts are alike in both sexes; probably young females cannot be distinguished from adults of the same sex after first winter; adults have a double molt each year, prenuptial (late January or February to late May) and postnuptial (September to November).

Field Marks. — Size, near that of Chipping Sparrow. Male in summer, the only New England bird of this size that is yellow with black wings and tail; flies with very pronounced undulating movement as if bounding through the air, calling meanwhile; female and young similar to male in everything but color, more brown than yellow, with wings and tail not so black as in male; male in winter resembles female but with wings and tail blacker; distinguished at once at close range from Siskins or Redpolls by solid color areas above and below, where Siskins and Redpolls are streaked.

Voice. — Call in flight *per-chic-o-ree* (F. M. Chapman); call when perched *chee* or *chee chee chee-we* or *pea-r-ee* (O. W. Knight); a canary-like call *wee-ee* (R. Hoffmann); song, long and somewhat canary-like but lacking the long trill of the Canary.

Breeding. — Usually in rather open country among scattered trees. *Nest:* In either deciduous or coniferous tree; often in maple, in fork near ends of branch from 4 to 20 feet from ground; neat and somewhat cup-shaped, composed of fine soft vegetal fibers and lined with thistle-down or similar soft material. *Eggs:* Usually 5, sometimes 4 or 6; .63 to .67 by .49 to .55 in.; bluish-white, unspotted; figured by E. A. Capen in "Oölogy of New England," Plate VIII, Fig. 3. *Dates:* July 10 to August 11, Massachusetts; July 20 to August 18 (September 5), Maine. *Incubation:* Period 11 days (A. H. Norton), 12 to 14 days (F. L. Burns); by female. One brood yearly.

Range. — Eastern North America and west to the southern part of the Rocky Mountains. Breeds in Canadian, Transition, and Upper Austral zones from central-eastern Saskatchewan, southern Mani-

toba, central Ontario, southern Quebec and Newfoundland south to northern Texas, southern Arkansas, central Alabama, northern Georgia and South Carolina and west to eastern Montana and eastern Colorado; winters over most of its range from Minnesota, southern Ontario, southern Quebec and Nova Scotia to the Gulf coast from Texas to Florida; accidental north to northern part of coast of Labrador.

Distribution in New England. — Common summer resident and migrant; less common and rather irregular winter resident; usually common resident all the year in Connecticut.

Season in Massachusetts. — Common April to October, but erratic and rather irregular and local, especially in winter.

Haunts and Habits. "Panoplied in jet and gold" the merry, care-free Goldfinches in cheery companies flit in the summer sunshine. They wander happily about, singing, wooing, mating, eating, drinking and bathing until July or August without family worries. As Dr. Chapman says: "Few birds seem to enjoy life more than these happy rovers. Every month brings them a change of fare, and in pursuit of fresh dainties the nesting-time is delayed almost until summer begins to wane. . . . Their love-song is delivered with an ecstasy and abandon which carries them off their feet, and they circle over the fields sowing the air with music."

This vivacious little finch is one of the most interesting and conspicuous birds of village, farm and field. Its flashing yellow, its undulating, bounding flight and its canary-like song have given it the name of Wild Canary among the country people.

The Goldfinch is a brave little bird. Mrs. G. H. McGregor of Fall River, Massachusetts, says that on May 5, 1925, eight Goldfinches and many Purple Finches were gathered under a tree eating seeds scattered there, when she saw one of the former birds, directly under the bill of a Purple Finch, eating bits that the larger bird dropped; and several times the little bird deliberately snatched food from the bill of the larger one, notwithstanding the attempts of the Purple Finch to drive it away, and less than a foot away from the first Goldfinch another was pilfering in the same manner from another Purple Finch.

Although many Goldfinches winter in New England their winter dress is rather dull in color, and except at close range it is difficult to distinguish them from other small finches, but when spring greenery tints the woods and fields, the males in their bright nuptial dress, in full song and increased in number by accessions of migrants from the south, become very conspicuous. As the season advances the attentions of the males to the females become more marked and their songs more frequent and ecstatic. Often a little company may be heard singing together. Like many other birds the Goldfinch can reduce the volume of its song until it seems far away, but it is capable of remarkable bursts of melody, sweet and long-continued. Thoreau rates the Goldfinch as a remarkable mimic, and says that he has heard it imitate the songs of the Brown Thrasher and the Purple Finch, but although some of its notes resemble some notes of the Purple Finch I have never been fortunate enough to hear it imitate the songs of other birds.

The Goldfinch delays its nest-building until the seeds of weeds begin to ripen and until it can find thistle-down, with which almost universally it lines its nest. So it is

not until most other birds have young that the Goldfinch begins to fashion its pretty fabric. Often the nest is not built until July or August. Young in September are not uncommon and Dr. C. W. Townsend says that once in early October he found young Goldfinches only a few days old.[1]

The nest is built chiefly or wholly by the female, while the male accompanies her in her labors, caresses her and cheers her with song. When the nest is finished (it, by the way, is often so compactly built as to hold water), and the pretty eggs are laid, the mother bird sits closely while her mate supplies her with food. She quickly recognizes his voice among the notes of other Goldfinches and with anticipatory flutterings answers him from the nest. When the birdlings are hatched they are fed by both parents, sometimes chiefly by the female, though her mate continues to feed her assiduously. The young are fed largely by regurgitation and probably in some degree on partly digested vegetal food, as in such cases the feeding does not occur as often as when insect food is supplied. However, there is evidence that many insects also are fed to the young. As the little ones grow the parents leave them much to themselves and never seem to manifest such fussy anxiety about them as is displayed by the Robin or the Catbird, nor are they so assiduous in cleaning the nest, which often presents a rather slovenly appearance before the young are ready to leave. They remain in the nest about fifteen or sixteen days and finally leave it with fluttering but typically undulating flight.

Goldfinches love companionship. They gather the year round in companies ranging from small groups to large flocks. Even in the breeding season those birds not engaged for the time being in the actual duties of homekeeping gather with others of their kind. As soon as the young are on the wing all assemble in their usual companies, and after a few weeks spent in seeking the good things of the autumn harvest of weed seeds and other dainties, they begin to move southward. Later, others come into New England from the north to take their places, and such movements continue until the rigors of winter are here. Then when the brown earth is covered deeply with billowy drifts of newly fallen snow, the flocks of Goldfinches in their dull winter dress sweep from weed patch to weed patch, or swirl and circle about among the pasture birches, seemingly intent only on feasting. Probably the flocks return at night, like the redpolls, to some coniferous thicket where, screened from the cold wind by the dense foliage, they may sleep in comfort. Dr. C. W. Townsend relates that one night at dusk one popped into a hole about a foot deep, in the snow at the base of a stump, and when driven from this refuge it cuddled into the protected side of a foot print in the snow.[2]

The food of the Goldfinch consists largely of a great variety of seeds, from which it skilfully extracts all nourishment, leaving only the husk. It splits the envelope of the dandelion and extracts its contents so nicely that only by careful examination can one discover the loss of the seed. It is a great destroyer of weed seeds, and two or three birds

[1] Supplement, Birds of Essex County, Massachusetts, 1920, p. 140.

[2] Townsend, C. W.: Memoirs of the Nuttall Ornithological Club, No. III, Birds of Essex County, Massachusetts, 1905, p. 252.

often may be seen hanging to the topmost branches of a slender weed until it bends to the ground under their weight, when they stand upon it and proceed to rob it of its fruition. It is so fond of the seeds of thistles that it is often called the Thistle-bird. Among other seeds of uncultivated plants, it takes those of the goldenrod, asters, wild sunflowers, wild clematis, mullein, evening primrose, dandelion, chicory, burdock and catnip.

The fondness of the little bird for burdock seeds now and then costs one its life, when it is caught and held by the strong hooks of the plant and, unable to break away, starves to death. The bird is so small that its strength is not sufficient to disengage itself when entangled by caterpillar silk. John Burroughs tells of one which had the top of one wing securely fastened to the feathers of its rump by this clinging material and so was completely crippled, and unable to fly a stroke.[1]

Among cultivated plants the Goldfinch eats the seeds of zinnia, coreopsis, bachelor's button, cosmos, millet, hemp, salsify, turnip, lettuce and sunflower, and some other garden plants. It takes the seeds of birch, alder, sycamore, spruce, hemlock, larch and perhaps a few other coniferous trees. Occasionally it eats a few tender buds, and now and then takes a nip from a succulent leaf of lettuce or some other garden plant, while drinking from its leaves the morning dew. In spring Goldfinches eat many insects at times, among them young grasshoppers, beetles, inch-worms and plant-lice and their eggs, and Dr. J. M. Wheaton says that they eat eggs of that imported wheat pest, the Hessian fly.

Economic Status. The Goldfinch is generally regarded as a beneficial bird. Its only injurious habit seems to be the destruction of seeds of cultivated sunflowers, cosmos, lettuce etc., which is sometimes so serious to the seed grower that he is obliged to take measures to protect his crops.

Spínus pínus (Wilson). Pine Siskin.

Other names: PINE FINCH; GRAY LINNET; PINE LINNET.

Plate 66.

Description. — Similar to Goldfinch in shape, but bill longer, more slim; head and body distinctly streaked. *Adults (sexes alike or similar)*: Above very light grayish-brown or brownish-gray (paling on lower back and rump and sometimes tinged yellowish there), conspicuously streaked dark olive-brown or dusky; wings and tail mainly dusky or blackish; middle and greater wing-coverts edged narrowly and tipped broadly whitish, forming two wing-bars, the first inconspicuous; tertials and some inner secondaries also edged whitish; basal parts of wing-feathers and tail-feathers light yellow (sometimes concealed); below, dull white, streaked dusky except abdomen and region about vent; bill brownish-dusky or blackish, often bluish at base below; iris brown; legs and feet dark brown to dark horn-color, reddish or even dusky, very variable. *Young in juvenal plumage:* Variable, but similar to adults, usually more buffy or yellow above than adults, with a tinge of brownish-olive, more yellow below and wing-bars buffy; streaked above and below with clove-brown.

Measurements. — Length 4.50 to 5.25 in.; spread 8.40 to 9.10; folded wing 2.75 to 3.00; tail 1.70 to 1.95; bill .35 to .45; tarsus .47 to .60. Weight, male .43 oz. (Wm. Evans). Female smaller than male.

[1] Burroughs, John: Signs and Seasons, 1904, p. 218.

Molts. — Juvenal plumage produced by complete postnatal molt; first winter plumage by partial molt (August, September) involving body feathers only; first breeding plumage result of wear and fading, followed by complete postnuptial molt, beginning in August and producing adult winter plumage; adults have only one (complete postnuptial) molt yearly (August, September); breeding plumage acquired by wear.

Field Marks. — Near size of Chipping Sparrow; a rather pale bird streaked darkly, two light wing-bars, and some yellow often showing about bases of flight-feathers and tail; similar to Goldfinch in flight and habits.

Voice. — Notes and calls somewhat similar to those of Goldfinch but more husky (C. J. Maynard); note like a very peculiar pronunciation of *swe-er* in a very sharp tone (T. M. Brewer); "a melancholy *chee-a*" (E. H. Eaton); notes like *tit-i-tit*, and a Goldfinch-like *see-a-wee* (L. N. Nichols); song like that of Goldfinch, but lower and often much prolonged; most of its notes have a peculiar buzzing or lisping quality; a throaty "watch-winding" note, *zwe-e-e-e-et* or *zree-e-e-e-e-eet*, inflection rising and intensity increasing until call ends abruptly (Grinnell and Storer); a singularly penetrating note *zuem* or *zeem* (W. L. Dawson).

Breeding. — Chiefly in coniferous forests on high mountains or in northern latitudes. *Nest:* Usually saddled on limb of some coniferous tree 8 to 30 feet from ground, among thick foliage; somewhat large for the bird, and not cup-shaped like that of Goldfinch, but rather flat, built of grass or twigs, moss, lichens and bark-strips and lined warmly with rootlets, plant-down, fur, hair, feathers or moss. *Eggs:* 3 to 6; .62 to .72 by .44 to .52 in.; rounded oval; pale greenish-blue, spotted or speckled with brown or purplish chiefly about or on large end, and usually spotted sparsely with blackish; figured by E. A. Capen in "Oölogy of New England," Plate VII, Fig. 4. *Dates:* March 18, New York; May 9 to 29, Massachusetts; very irregular, breeding variously from March to August.* *Incubation:* No information available on Pine Siskin; period of European Siskin said to be 12 to 14 days (H. F. Witherby); chiefly or wholly by female. One brood yearly; probably two in many cases.

Range. — North America. Breeds mainly in Canadian Zone from central-southern Alaska, central Yukon, southern Mackenzie, northern Manitoba, Ontario, southern Ungava (Quebec) and southern Labrador south chiefly in higher western mountains to southern California, southern Arizona, southern New Mexico, southern Coahuila (Mexico) and south at lower elevations to southern Nebraska, central Minnesota, northern Michigan, northern Ohio (casually), southeastern New York, Massachusetts and south in the Alleghanies to North Carolina; winters from British Columbia, Minnesota and southern Quebec south over most of the United States to northern Mexico and from Texas to southern Florida; casual on the Pribilof Islands, Alaska.

Distribution in New England. — *Maine:* Common but rather irregular resident in northern counties; elsewhere irregular, chiefly in migration and in winter. *New Hampshire:* Common to rare and irregular resident, breeding mainly above 3,000 feet. *Vermont:* Irregular transient visitor; breeds rarely and irregularly; most common in late autumn. *Massachusetts:* Irregularly common or abundant migrant and winter visitor, breeding casually.† *Rhode Island and Connecticut:* Irregularly common migrant and winter visitor.

Season in Massachusetts. — September 19 to May 30 (summer).

Haunts and Habits. The Pine Siskin is almost as erratic as the crossbills. During every month in the year small flocks wander about as if there were no such thing as a breeding season, and individuals may be seen occasionally in summer far south of their

* In 1925 they bred very early in Vermont, while the ground was still covered with snow. Mr. R. M. Marble wrote to me from Woodstock that the young were ready to leave the nest March 19.

† Early in May, 1859, a nest was found in Cambridge, by Frederick Ware, and recorded by T. M. Brewer (Baird, Brewer and Ridgway, History of North American Birds, Land Birds, Vol. I, 1874, p. 482). On May 29, 1883, another was found by D. W. Park in Newton (Birds of the Cambridge Region, William Brewster, 1906, p. 263, and Birds of Wellesley and Vicinity, A. P. Morse, 1897, p. 30).

usual breeding grounds. They may breed one year in a certain region and far away the next, and in migration or in winter they may visit a locality in great numbers one year and pass it by the next. Apparently they migrate southward regularly in autumn and northward in spring, but probably they take long flights and pass over considerable areas without stopping. Although they are reported in Massachusetts every year, they cannot be expected in great numbers more often than from once to three times in a decade. In 1869 they were reported as common in Cambridge until the last of June and were seen "on two or three occasions" in July.[1] There are numerous later reports of the bird in summer and formerly it was seen occasionally about Mount Greylock at that season, and probably bred there, but as most of the spruce woods in Massachusetts have been destroyed, the breeding of the Pine Siskin here now would be fortuitous. It has appeared recently in northern Maine in large flocks, as in former years when abundant. Along our Atlantic seaboard the greatest flight apparently takes place in autumn. With us it comes almost invariably in flocks searching for food in weedy fields and among birches and alders, like the Goldfinch and Redpoll. It is difficult to distinguish these three species one from the other at a distance, as their flocks, flight and notes are somewhat alike and they sometimes intermix.

The Pine Siskin frequents pines (especially pitch pines) and spruces of various kinds. Siskins are very active birds. A large flock settles in the trees, springs up again, swirls back and forth and round about, and settles again in about the same place. When hundreds rest thus on the trees, uttering their "z-ing" calls in concert, a humming, buzzing sound fills the air. One of my correspondents says that she called her sister from the house to see an immense flock; the sister said "that noise cannot be made by those tiny birds, there must be an automobile here somewhere with its engine running." When assured that there was no car near, she said, "then there must be some kind of farm machine running." But she was soon convinced that the sound came from the birds, when they rose, swirled about and settled again. Now and then Siskins — always hunting for food in winter — find their way to a feeding station, where some of them are likely to be caught by the house cat. A friend writes that he saw one feeding near his home, but was not quite sure of its identity until, on going out, he met the cat coming in with the bird in its mouth.

In time, and under kind and gentle treatment, these wild and restless birds become very tame and confiding. Mr. William Holden of Leominster, Massachusetts, wrote to me in March, 1926, that he and his neighbor, Mr. E. R. Davis, had been feeding the birds during the winter, and among others that came to be fed were about one hundred and fifty Pine Siskins. He said that Mr. Davis was not inclined to rise with the lark and that on mornings when there was no seed out for the birds the Siskins sat about on the tree-tops for awhile and then began to fly into the open window of his bedroom, and to hop on the bed near his face. If he simulated sleep and their dish of seeds was covered, some of them pulled his hair, and if he then showed no signs of animation, they seemed to

[1] Allen, J. A.: American Naturalist, Vol. III, 1870, p. 582.

brace backward and pull harder. They have been known even to tweak his ears and nose. Finally when he opened his eyes and uncovered the food dish, they hopped upon it and began to eat.

One morning Mr. Davis covered his head, leaving only a small hole through which to observe the birds. At first his feathered visitors were at a loss, but finally one discovered the peep-hole and reaching in began tapping his friend on the forehead. When Mr. Davis finally turned and reached for the food dish, one bird rode over to it on his hand, so as to be the first at the repast. The first comer to the food dish was often belligerent, and until it had satisfied its appetite attacked and drove away the others. One morning the second visitor found that it could not frighten the first comer away. Number two then perched on the back of a chair and regarded first the food dish and then Mr. Davis as he lay in bed. Then, apparently having reflected and decided, it flew to Mr. Davis, who still lay in bed, and began pulling his hair. Mr. Davis then reached out one hand and cupped it above the feeding bird. As the hand gradually began to close, the feeding bird became uneasy and finally flew, when the other bird immediately hopped into the dish. Since the above was related to me by Mr. Holden, Mr. Davis has written quite a full account of his experiences, with photographs of the birds on his hand and on his dining table.[1] Some of these birds roosted at night on a clothesline in the kitchen. The reader should peruse this account in Bird-Lore, which gives some interesting experiments showing the intelligence of these birds.

Pine Siskins have been attracted to feeding stations by millet seed, and by chaff from barn floors. They are extremely fond of cracked butternuts. Their ordinary food on their breeding grounds consists largely of insects and the seeds of coniferous trees.

Their southward migrations in unusual numbers doubtless are caused chiefly by lack of their usual food in the North. In the summer and autumn of 1925 thousands of Pine Siskins appeared in Maine searching over farms and villages for food. They invaded gardens, stripped beets, beans and other plants of their leaves, and ate the blossoms of many flowering plants. Mr. E. O. Grant wrote to me from Patten, Maine, that he had seen as many as a thousand of these birds on half an acre. In Massachusetts they feed on the seeds and buds of coniferous trees and the seeds of birches and alders, maples and elms; in winter, they eat berries, such as those of the Virginia juniper and honeysuckle, and the seeds of many weeds and grasses. The seeds of northern white cedar, or *Arbor vitæ*, are favorites with these birds, and they seem fond of the aphids that breed on willows.

Economic Status. The Pine Siskin seems to be of little economic importance in New England, but it is usually harmless.

Carduélis spínus (Linnæus). European Siskin.

Note. Mr. William Brewster gives a record of this species as seen by him at Cambridge, Massachusetts, in August, 1904. He says: "There was nothing in either its appearance or behavior to suggest that it had ever been caged, but the chances are, of course, that it had *originally escaped from captivity*." [2]

[1] Bird-Lore, Vol. XXVIII, 1926, pp. 381–388.

[2] Birds of the Cambridge Region, 1906, p. 264.

Plectróphenax nivális nivalis (Linnæus). Snow Bunting.

Other names: SNOW-BIRD; WHITE SNOW-BIRD; SNOW-FLAKE; SNOW LARK.

Plate 67.

Description. — Bill very small, conic, cutting edges turned inward, ridge slightly curved; nostrils covered by short bristly feathers; wings long, pointed; tail very slightly forked; hind claw about as long as its toe. *Adult male in breeding plumage:* Pure white, except alula, back, scapulars, most primaries, tertials and four to six inner tail-feathers, all of which are chiefly black, as sometimes also are greater wing-coverts and rump, there is often a little black on white outer tail-feathers, and some white edging around tips of black feathers; some birds (perhaps immature) have much of the black varied with white; iris dark brown; bill, legs and feet usually black. *Adult male in winter plumage:* Browner than in summer; white of upper plumage stained brownish, particularly on top of head, and black of body plumage and wing-coverts veiled by white or brownish tips and margins; bill straw-color with black ridge, or yellow, brownish-yellow or brown. *Young male in first winter plumage:* Similar to adult winter male, but lesser wing-coverts black, or black with white edges, primaries with less white at bases, feathers of nape and back sometimes with small black spots. *Adult female in breeding plumage:* Similar to male, but black of upper plumage tinged brownish, somewhat varied with white and extending almost to tail; white of head and neck more or less brownish; bill dusky. *Adult female in winter plumage:* Similar to female in summer, but stained above with rusty-brown, and black veiled by light edges as in male; wings with much less white than in summer, which is largely replaced by brown; much brown on head and on sides of breast; feathers of head and nape dull brownish-black basally; bill yellowish. *Young female in first winter plumage:* Like adult female, but usually with more black in secondaries. *Young in juvenal plumage:* Above brownish-gray (some are mottled), streaked faintly on head and more broadly on back with blackish; wings blackish with ashy feather-edges, bases of coverts and primaries white, secondaries largely white, tertials broadly edged brown; central tail-feathers dark brown margined lighter, the rest white, edged with brown and streaked black; below, largely white, turning to brownish-gray on throat, breast and sides; flanks tinged brownish; sides of breast sometimes faintly streaked dusky; "bill pinkish-flesh-color, feet dull black" (J. Dwight).

Measurements. — Length 6.00 to 7.35 in.; spread 12.00 to 13.00; folded wing 4.00 to 4.50; tail 2.50 to 3.15; bill .39 to .45; tarsus .75 to .90. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by molt (August, September) of body plumage and part of wing-coverts, apparently involving neither flight-feathers nor tail; first breeding plumage is chiefly the result of wear, with some renewal of feathers about head and neck in spring; at first (complete) postnuptial molt immature birds become as adults; adults have complete postnuptial molt (August, September).

Field Marks. — Bluebird size; the only New England land bird that appears white below in flight (including lower surfaces of wings, excepting dark ends) and largely brown above; white secondaries conspicuous in contrast with black primaries; feeds chiefly on weed seeds, in open fields; common on the coast; flies and wheels in rather compact flocks.

Voice. — A high, sweet, slightly mournful *tee* or *tee-oo;* "a sweet rolling whistle and a sharp *bzz*" (R. Hoffmann); a tinkling whistle and a sharp *beez-beez* (E. H. Eaton); a sweet song on the breeding grounds.

Breeding. — On Arctic shores and mountain sides. *Nest:* On ground or rocks, usually hidden under large stones, in crevices, or by tussock or grass-tuft; largely dead grasses, plant-stalks and a little moss; lined with finer material, as hair, fur, wool and many feathers. *Eggs:* 4 to 8; .70 to .95 by .60 to .65 in.; exceedingly variable; white, greenish-white, bluish-white or ashy-white, with reddish-brown, yellowish-brown, dark brown or blackish-brown spots (sometimes with violet shell markings) and sometimes dark brown scratches, all variously distributed; figured by Henry Seebohm in "A History of British Birds,"

1885, Plate 15. *Dates:* June 9, northern Greenland; breeds in various parts of its range from May to July. *Incubation:* Period 14 days (H. F. Witherby); by female chiefly. One brood yearly.

Range. — Northern Hemisphere. In America breeds in Arctic Zone from northern Alaska, northern Grant Land and northern Greenland south to central-western Alaska, northern Mackenzie, northern Keewatin, northern Ungava (Quebec) and northern Labrador; winters from northwestern Alaska, Alberta, Saskatchewan, northern Manitoba, and northern Labrador coast to northern California (irregularly), southern Oregon, Colorado, northern New Mexico, Kansas, central Missouri, Illinois, Indiana, Ohio, Pennsylvania and New Jersey; casually farther south in Kentucky, Virginia, Georgia, Florida and the Bermuda Islands.

Distribution in New England. — Common migrant and winter resident, chiefly in open lands; most common coastwise, irregularly distributed in the interior. Has been reported in summer in Maine, New Hampshire and Vermont. Audubon reports a breeding record in the White Mountains, and J. A. Allen one in Massachusetts; but such records are evidently erroneous.

Season in Massachusetts. — October 7 to April 19.

Haunts and Habits. The Snow Bunting is a typical boreal bird. It hazards its fortune to the north wind. Its home is in Arctic wastes. It is one of the few small land birds that goes as far north as land extends, and it nests in numbers in northern Greenland. Captain Donald MacMillan says the Eskimos assert that some "stay at Etah all winter," but we are at liberty to doubt the evidence.

When winter really comes to New England, when icy blasts sweep down from the north and snow fills the air and whitens field and pasture, these little birds ride down on wintry winds and whirl about the fields amid the driving snow. As they wheel and turn in concert, their brown backs and black-tipped wings veer and careen about amid the snowflakes until, with a sudden swing, they turn their white under sides toward us and disappear in the snow-filled air, only to reappear as the next turn brings their backs to our view. Having swung back and forth and from side to side, and viewed their landfall from every vantage point, they glide toward the earth, alight in a patch of weeds or tall grass that projects above the snow, and running along from plant to plant, help themselves to the well-ripened seeds. While thus occupied they are always moving along over the surface of the snow, running rapidly, walking and even hopping or jumping occasionally, eagerly snatching, hulling and swallowing the winter offering of the weeds and grasses. They are not particularly shy, but any unusual sound or motion will send them all into the air at once. They feed mostly in the fields, but also in farm-yards, about manure heaps and in the roads. Formerly before the "English" Sparrow came they even invaded the cities, where they picked up grain about the freight yards and found some food in suburban streets; but the belligerent sparrows soon drove them out.

John Burroughs says that this is the only one of our winter birds that really seems a part of winter — that seems born of the whirling snow, and happiest when storms drive thickest. Its calls, coming out of the white obscurity, are the sweetest and happiest of all winter bird notes. "It is," he says, "like the laughter of children. The fox hunter hears it on the snowy hills; the school boy hears it as he breaks through the drifts on his way to school; it is a voice of good cheer and contentment."

PLATE 67

LAPLAND LONGSPUR

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FEMALE IN WINTER

MALE IN WINTER

SNOW BUNTING

Page 33

FEMALE IN WINTER

MALE IN WINTER

Louis Agassiz Fuertes

It nests on the hills and mountains of Arctic islands and gets much of its food along the shore, where also it finds sand for its little digestive mill. So when winter comes, many Snow Buntings naturally gravitate toward the seashore and gradually move southward along the coast. After early October they may be confidently looked for on the Massachusetts coast, while they are rarely seen in October in the interior, and often do not become at all common there until snow flies. The Snow Bunting is a harbinger of winter. It is forced southward in severe winters, for the deep snows cover much of its favorite food in the interior, and the northern beaches are buried in ice. The appearance of Snow Buntings in large numbers in New England is considered generally to signify the approach of a hard winter, and it certainly indicates heavy snow to the northward. The Scandinavians call them "hard-weather birds."

The Snow Bunting is a hardy bird — well clothed against the wintry blast. Mr. C. J. Maynard wonders in his "Birds of Eastern North America" where the Snow Buntings sleep, for he says that at Newton, Massachusetts, as night came on, they always started toward the coast. As Newton is only a few miles from the sea, the birds very likely slept on or near the shore. Large numbers remain near there all winter, and are only driven into the interior by severe northeasterly storms. When the snow is soft, these birds are said to dive into it (as they do sometimes when pursued by hawks), and there pass the night. When the snow is frozen hard, the flocks sleep in the open, protected from the north wind only by some slight rise in the ground, by sand dunes, or by a stone wall. Once, after the flocks had gone northward, I found a lone bird in Westborough, Massachusetts, after most of the snow had disappeared. It wandered about the fields calling plaintively for its comrades, and at night it slept on a snowdrift on the south side of the old Boston Turnpike. I found it there night after night close to a bank wall. It may have sought shelter in a crevice in the wall, for each night it sprang up from the same spot when I began to move toward it, crunching the frozen snow. Snow Buntings necessarily are very light sleepers; when caged, they are said to be always awake and moving, when approached in the night. The wild birds leave their resting place at the first hint of light in the east, and begin feeding while it is still quite dark. They have never been known to roost in trees at night, but some flocks frequently alight in them or on the roofs of buildings. I have seen an apple tree almost covered by a great flock of these birds, and they may be seen now and then on fences or stone walls, but I have never seen a Snow Bunting in the woods.

Sometimes in March a soft song may be heard from some male bird, but not the loud, clear song of the nesting time, which probably is never heard in our region. As spring approaches the wear of the plumage begins to show, and sometimes birds that stay late appear in the black and white dress of summer. Most of them leave for the north in February, while still in winter dress. The Eskimos kill large numbers of these birds for food, and, formerly, thousands were killed by gunners in this country. Even as late as the early part of this century great numbers were shot here illegally and sold to epicures. Mr. William Dutcher, former president of the National Association of Audubon Societies,

reported in 1903 that "very recently" 80,000 Snow Buntings were found in a single cold storage warehouse in one "of our eastern cities." The marketing of these birds has now been practically eliminated, though some, doubtless, are still shot and eaten. Their destruction for food purposes may be one reason why we do not see such large flocks in New England as were here in the seventies of the last century, when they came in enormous hordes.

In New England the Snow Bunting feeds mainly on the seeds of grasses and weeds. It takes small grains wherever it can find them and is fond of the seeds of millet and hemp. When deep snow covers its usual food, it sometimes feeds on the seeds of alders and birches. It eats also the seeds of a few water plants, and along the coast takes tiny crustaceans and other small forms of marine life, sometimes following the retreating waves or gleaning in pools like the sandpipers. On its breeding grounds it takes many insects, and its young are fed largely on them.

Economic Status. The Snow Bunting seems to be of little economic importance, although it destroys the seeds of most common weeds. Manitoba farmers said that in early May, 1896, when Snow Buntings were still in the field, the birds pulled up the young wheat blades.[1] In New England it is harmless, as the grain it takes is waste grain.

Calcárius lappónicus lapponicus (Linnæus). Lapland Longspur.

Plate 67.

Description. — Bill small, acutely conic, ridge nearly straight, sometimes depressed toward middle; nostrils nearly naked; wing long, secondaries emarginate; tail fully two-thirds as long as wing, slightly forked; hind claw about as long as its toe or longer; coloration very variable. *Adult male in breeding plumage:* Above, generally light brownish or buffy-yellowish, broadly streaked dusky or brownish-black; wings blackish-brown, their coverts and tertials edged chestnut, two white wing-bars; tail blackish-brown, edges of longer quills paler, two outermost tail-feathers largely white, next with some white and with black shaft-streaks at ends; head nearly all round, and upper breast, black; broad white or pale buffy stripe over and behind eye, extending down neck from behind ear-coverts along edge of the black, and then backward along side of upper breast; often some buffy or buffy-white on back of head, and always a broad chestnut half-collar at base of neck extending from back of neck to its sides; below, whitish, sides streaked broadly with black; wing linings mostly whitish with brownish markings near outer edge; bill yellow, black at tip; iris dark brown; legs and feet dark brown or black. *Adult male in winter plumage:* Black of head confined mainly to crown (where divided by central light stripe) and lower hind border of ear region; some black on lower part of throat and patch on upper breast, all more or less hidden or obscured by whitish or pale brownish feather-tips, which also veil the chestnut on hind neck; stripe over eye much more brownish than in summer; tail-feathers margined with rusty, the two outer partly white; yellow of bill obscured by brownish. *Young male in first breeding plumage:* About as adult male in breeding plumage, but some black feathers left in throat-patch and some tiny black spots on chestnut half-collar, which finally wear off. *Young male in first winter plumage:* Like adult male in winter, but chestnut half-collar around back of neck with tiny black spots. *Adult female in breeding plumage:* Much like male in winter, but markings more sharply defined; less black on fore parts; hind neck streaked blackish. *Adult female in winter plumage:* Similar to breeding plumage, but darker;

[1] Broley, C. L.: *in litt.*

markings of head and upper breast less indistinct, chiefly dull brownish; feathers of lower throat and upper breast often with large dusky centers; chestnut on back of neck barely noticeable; below whitish. *Young female in first breeding plumage:* As adult female in breeding plumage, but some unmolted feathers of upper breast streaked. *Young female in first winter plumage:* Much like adult female in winter, but with some black on feathers of sides of head and along sides of throat; feathers of lower throat and upper breast streaked black and tawny. *Young in juvenal plumage:* Above buffy-yellow and brownish, streaked heavily with black; sides of head similar, but ear-coverts slightly browner, with a little whitish behind them; lower fore plumage and flanks buffy-yellow or brownish, streaked as above; elsewhere below white; wings and tail much as in adult.

Measurements. — Length 6.00 to 7.00 in.; spread 10.50 to 11.75; folded wing 3.30 to 3.90; tail 2.30 to 2.83; bill .39 to .50; tarsus .65 to .95. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by molt of body plumage and lesser and middle wing-coverts (late July to September), rest of juvenal wings and tail retained; first breeding plumage by partial molt of head and throat, and by wearing off of feather-tips elsewhere; adult winter plumage by complete postnuptial molt (mostly August); breeding plumage follows partial molt, as in juvenal, but is largely acquired by wearing away of light feather-tips.

Field Marks. — A little smaller than Snow Bunting; often seen with or near them, or near Horned Larks, or both, but much darker than Snow Bunting and lacking yellow and black throat markings of Horned Lark; smaller size, slender form and dark coloring should distinguish them from either of the foregoing. In flight, when seen with Snow Buntings, their *dark* sharp-pointed wings contrast with the white areas and black tips of wings of the Snow Buntings.

Voice. — A hoarse rattling *chirr*, and a "sweet *tyee*" (R. Hoffmann); male has a sweet flight-song on breeding grounds.

Breeding. — On barren grounds and Arctic tundra or flats, often among dwarfed trees. *Nest:* On ground, on tussock, or under dwarfed tree or bush; built of grasses and sometimes moss, lined with feathers, some with hair. *Eggs:* 5 to 7, usually 6; .78 to .92 by .55 to .65 in.; pale greenish-clay-color or greenish-gray to olive-brown, spotted and blotched thickly with reddish-brown and sometimes also with darker brown and lilac; figured by Henry Seebohm in "A History of British Birds," 1885, Plate 15. *Dates:* Mostly in June; June 6, northern Alaska. *Incubation:* Chiefly by female. One brood yearly.

Range. — Eastern and central North America. Breeds from about latitude 75° in east Greenland, latitude 73° in west Greenland, and Baffin Island, Somerset Island and central-northern Mackenzie south over the Barren Grounds to tree limit in central-southern Mackenzie, northern Manitoba, northern Ontario, northern Ungava (Quebec) and northern Labrador; in winter from South Dakota, Minnesota, Wisconsin, Michigan, southern Ontario and southern Quebec south to northern Texas, Oklahoma, Arkansas, Kentucky and South Carolina.

Distribution in New England. — Rather uncommon fall migrant coastwise, rare to very rare in interior; always rare even coastwise in spring, and usually uncommon to rare winter resident in Massachusetts, Rhode Island and Connecticut.

Season in Massachusetts. — October 5 to May 1.

Haunts and Habits. The Lapland Longspur is seen rarely in the interior of New England and is uncommon generally on the coast. At Ipswich, Massachusetts, it is most common in November and December. It usually arrives in small numbers with the early Snow Buntings and Horned Larks, and often feeds with them, flocking with them, though in flight it sometimes rises above the main flock. Most of the records in the interior of New England come from the Connecticut Valley. In Massachusetts it seems least uncommon about the region of Ipswich, though even there it is rare in spring and often in winter. It frequents sand-dunes and beaches, and occasionally salt-marshes.

In the interior it seeks stubble fields and plowed lands. In migration in the United States, this bird keeps in the interior for the most part, between the Alleghanies and the Rockies, and is rarely seen on the Atlantic seaboard of the middle and southern Atlantic coast states.

It runs about with Horned Larks, but unlike them it frequently alights on the stalks of beach grass or weeds, and clinging to them feeds in that position; also it runs along with the larger birds and feeds from the ground or snow. It is a difficult bird to find, as when approached, it is likely to squat on the ground, where, in the protective colors of its winter plumage, it seems to disappear, and a number thus concealed may be overlooked.

The food of the Lapland Longspur while in the United States consists mainly of the seeds of grasses, weeds and grain. It is fond of millet seed also. Insects form a very small proportion of its food while here, according to Dr. Judd.[1]

Economic Status. See page 2.

Calcarius ornátus (J. K. Townsend). Chestnut-collared Longspur.

Description. — Similar in shape to Lapland Longspur, but colors differently distributed and very variable. *Adult male in breeding plumage:* Top of head, narrow stripe behind eye connecting with crescentic spot on lower ear-coverts, breast and anterior abdomen black, sometimes touched below with reddish-brown or chestnut; hind neck deep rufous-chestnut; patch on nape, broad stripe above eye, chin and throat white; cheeks pale buff, this sometimes covering lores, ear-coverts, chin and upper throat; in some specimens (probably in highest plumage), lesser wing-coverts deep black with more or less white tips; lower belly, sides, flanks, wing-linings and under tail-coverts chiefly white; back, rump and scapulars brownish-gray striped with black feather-centers; wings dark brown with pale feather-edges; tail dark brown centrally with two or three outer feathers mostly white, and all white basally; tip of bill dusky and sometimes ridge also, rest dull yellow, in some cases bluish; iris brown; legs brown, feet dark brown. *Adult male in winter plumage:* Black of head, lower plumage and chestnut on hind neck obscured or concealed by light brownish or buffy feather-tips, otherwise much as in breeding season; in this plumage all have lesser wing-coverts black with last row white. *Adult female in breeding plumage:* Above light grayish-buffy-brown, streaked dusky; below, paler tint of same or dull grayish-buffy, breast and belly sometimes streaked darker; under tail-coverts dull buffy, whitish or white. *Adult female in winter plumage:* Similar to female in breeding plumage but plumage softer and colors more blended. *Young:* Dusky or clove-brown; feathers margined with dull whitish and pale brownish-buff; wing-coverts tipped dull whitish; indistinct whitish-streaked line above eye; ear-coverts streaked dusky and pale brownish; lower jaw, chin and throat white, flecked dusky-grayish; rest of lower plumage dull grayish-buff, streaked dusky, especially on breast.

Measurements. — Length 5.25 to 6.50 in.; spread 10.10 to 11.00; folded wing 3.00 to 3.50; tail 2.00 to 2.30; bill .40 to .46; tarsus .75 to .80. Female smaller than male.

Molts. — Similar to those of Lapland Longspur (see page 37).

Field Marks. — Size little smaller than Song Sparrow; adult male in summer has a pale or whitish face and throat and *black breast;* flight undulating; may be known in flight by great *amount of white on either side of tail.*

Voice. — "A chirp, uttered with each impulse of the wings" (Coues); a sweet twittering song.

Breeding. — Chiefly in open, high, treeless prairies. *Nest:* On ground, concealed under grass-tuft;

[1] Judd, Sylvester D.: The Relation of Sparrows to Agriculture, United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 54, 55.

built mostly of grass and plant stems, sometimes lined with hair. *Eggs:* 3 to 6, usually 4; about .80 to .90 by .53 to .65 in.; resembling those of Lapland Longspur, but usually smaller; very variable, sometimes little marked. *Dates:* May 8 to July 10, prairie states. *Incubation:* No information. One brood yearly, probably two in some cases.

RANGE. — Great Plains of North America from central-southern Canada to southern Mexico. Breeds from central Alberta, southern Saskatchewan and southern Manitoba south to central-southern Montana, southeastern Wyoming, eastern Colorado (probably) and central Kansas and east to central Nebraska and western Minnesota; casual in migration east to Missouri and Illinois; winters from Colorado, Kansas and western Iowa south to Arizona, Texas, Sonora, the southern end of the Mexican tableland in the State of Puebla; accidental in Maine, Massachusetts, New York, Maryland, British Columbia and southern California.

DISTRIBUTION IN NEW ENGLAND. — Accidental visitor. Records: *Maine:* Scarboro, August 13, 1886, bird taken by Joseph L. Goodale.[1] *Massachusetts:* Gloucester, July 28, 1876, male taken by C. W. Townsend, recorded by T. M. Brewer, and placed in collection of Boston Society of Natural History.[2]

HAUNTS AND HABITS. The Chestnut-collared Longspur is a prairie bird, living normally on the great plains of the West. It is a mere straggler in the East, taken but twice in New England, and in both instances near the coast. It consorts with other longspurs in autumn, and its habits and food are much the same as those of the Lapland Longspur. Evidently it is a wide-ranging species, and as it has been taken in the East in the coastal region, it may be expected to occur again on the New England coast. Its plumage is so variable that the only dependable field mark is the great amount of white in the tail — greater than that of any other bird likely to be seen with it.

Rhynchóphanes mccówni (LAWRENCE). McCown's Longspur.

NOTE. On page 127 of "The Birds of Massachusetts" by Reginald Heber Howe, Jr. and Glover Morrill Allen, the following paragraph appears:

"Mr. C. J. Maynard records one taken on January 7, 1877, by Mr. E. A. Bangs at Ipswich. This specimen we learn from Mr. O. Bangs was bought in the Boston Market by him and his brother when boys, they being told at the time that the bird came from Ipswich, but although Mr. Bangs believes the specimen to probably have been taken in the State, the evidence is so insufficient that the record is only worth this casual mention."

There is little doubt that the bird was shot with Snow Buntings somewhere along the New England coast, but as it was not taken by Mr. Bangs it is too late now to establish the record. Within the past ten years two reports of this species have come to me from points on the Massachusetts coast, but as the birds were merely seen and not taken, and as there are no authentic eastern records, the species must remain for the present in the hypothetical list.

Pásser doméstícus domesticus (LINNÆUS). House Sparrow.

Other names: ENGLISH SPARROW; SPARROW.

Introduced Species.

Plate 74.

DESCRIPTION. — Form stouter and more robust than any native sparrow; head and bill large and strong; tail slightly forked. *Adult male in breeding plumage:* Top of head and rump ashy-gray, bright-

[1] Auk, Vol. IV, 1887, p. 77.

[2] Bulletin, Nuttall Ornithological Club, Vol. II, 1877, p. 78.

est on head and nape, forming a cap on head, bordered below on each side by a long chestnut patch, extending from eye to nape and spreading out on sides of neck; small white spot over back part of eye; back and scapulars broadly streaked black, chestnut or rusty-brown and buff; upper tail-coverts tinged brown; wings and tail chiefly dusky or blackish-brown, tail-feathers edged lighter; outer surface of closed wings colored much like back, because of brown edges; greater wing-coverts and tertials broadly edged and tipped chestnut-buff, middle coverts black or blackish with broad white tips forming wing-bar, lesser wing-coverts chestnut; lores, stripe under eye, chin, throat and middle part of upper breast black; ear-coverts grayish; sides of lower jaw and sides of neck white or whitish; rest of lower plumage mostly buffy-whitish or grayish-white, turning to gray or buffy-gray on flanks; under tail-coverts tinged centrally brownish-gray; wing linings grayish or whitish; bill black; iris dark brown or hazel; legs and feet brownish. *Adult male in winter plumage:* Similar to male in summer but tinged more brownish above, white parts less pure and tinged with brownish, and black feathers of throat and breast partially concealed by whitish edges; bill usually dark brown, paler below or growing yellowish toward base; legs and feet brownish or pale brown. *Adult female:* Above chiefly brown, tinged olive; back streaked as in male, but lacking chestnut streak behind eye, and brownish-buff below it; no black on chin or throat; breast and flanks grayish-brown with buffy tinge; bill colored much like that of winter male. *Young in first winter plumage and first breeding plumage:* Like adults, but males have black feathers of chin more veiled by white than in adults. *Young in juvenal plumage:* Like female, but often with obsolete dusky streaks on throat and upper breast; throat and belly white; young males often have decided tinge of ashy-black in middle of breast; "bill and feet pinkish-buff, the former becoming dusky and black before spring and the latter sepia-brown" (J. Dwight).

Measurements. — Length 5.50 to 6.35 in.; spread 9.44 to 9.92; folded wing 2.85 to 3.00; tail 2.20 to 2.50; bill .50 to .68; tarsus .58 to .74. Weight averaging 1.05 oz. (W. H. Bergtold). Female smaller than male.

Molts. — Juvenal plumage assumed by complete postnatal molt, completed after young bird leaves nest; first winter plumage by complete postjuvenal molt (September, October), this plumage retained until first postnuptial molt; first breeding plumage by wear, young bird becoming practically as adult when about one year old; adults have but one molt annually, postnuptial and complete (August to October); breeding plumage results from wear.

Field Marks. — Near Song Sparrow size, but tail shorter and slightly forked, bird much stouter and head larger. *Adult male:* Recognized by gray or grayish cap and black throat-patch extending down middle of upper breast. *Female and young:* Similar in shape to male, but brown without black and gray areas.

Voice. — Common call in spring *chissick chissick; tchirp* and the alarm *tell tell* are heard most often (H. F. Witherby); also a harsh chatter, no real song.

Breeding. — Chiefly near houses or other buildings. *Nest:* On branch of tree near trunk, in hollow tree, woodpecker's hole, bird house or some cavity about building, sometimes in hole in wall; untidy, built of grass and straw, warmly lined with feathers, etc.; when in branches a bulky, domed affair with an entrance at one side, but when built in small hole little lining used. *Eggs:* 4 to 9, usually 5 or 6; .84 to .90 by about .60 to .62 in.; ovate; dull grayish-white, spotted and speckled with reddish-brown or dark brown and gray, but coloring variable; figured by Henry Seebohm in "A History of British Birds," 1885, Plate 13. *Dates:* April to August, sometimes earlier, sometimes later; have been seen building in February in Massachusetts. *Incubation:* Period 13 to 14 days; chiefly by female. Two or three broods yearly, probably more in some cases.

Range. — Resident in all Europe except Italy, where only casual; east through Siberia to Irkutsk and Dauria. Introduced into New Zealand, Hawaii, South America, North America, southern Greenland and elsewhere. Now resident in North America from central British Columbia, central Alberta, central Saskatchewan, central Manitoba, northern Ontario, southeastern Quebec and Newfoundland south to northern Lower California, southern Arizona, southern New Mexico, southern Texas,

Tamaulipas, southern Louisiana, southern Alabama, Florida, Cuba, Bahama Islands and Bermuda Islands.

Distribution in New England. — More or less common resident about farms, villages, towns and cities, though absent in some localities; rare or wanting in forested regions.

Season in Massachusetts. — Permanent resident.

History. The European House Sparrow, or "English" Sparrow as it is commonly called, has been known in the Old World from time immemorial. For ages it has been considered typical of the sparrow tribe, and has been the most prominent of all passerine birds, because of its intimate parasitic relation to mankind. This is the "sparrow" mentioned in the Bible and other ancient literature, but now we are told by Professor Peter P. Sushkin, who has studied its habits, anatomy and osteology, that it is not a sparrow at all but a weaver-bird, which probably spread over Europe long ago from Africa.[1] If we accept his conclusion, we can only surmise how artificial and erroneous much of our classification may be, based as so much of it is, not upon structural differences but on superficial characters. However, as ornithologists have always regarded this bird as a sparrow, it may as well take its place here following the so-called finches and heading the list of New England sparrows. The name "English Sparrow" is a misnomer, as the species inhabits the greater part of Europe (and is not a sparrow), but the name was derived from the fact that most of the individuals brought to this country came from England.

In 1850 eight pairs were introduced at Brooklyn, New York, by Hon. Nicholas Pike and other directors of the Brooklyn Museum. The birds did not thrive, and in 1852 many more were imported, and those that survived the winter in confinement were liberated in Greenwood Cemetery. These multiplied, and they and their progeny spread over the country. In 1854 some were introduced at Portland, Maine.[2] Others were liberated at Peacedale, Rhode Island, and Boston, Massachusetts, about 1858, and at New Haven, Connecticut, in 1867. The first birds to reach Boston were escapes from the Peacedale consignment which was landed there, but it was not until 1869 that the species became established at Boston. In the meantime other importations to various parts of the country occurred, and the "craze" for introducing these birds continued for several years thereafter. There are more than a hundred cases on record of the introduction of this bird to places in the United States and Canada.[3] Some were brought from Europe and others were transported from city to city. The birds, finding a plentiful supply of food in the undigested seeds in horse droppings, multiplied exceedingly, and spread with amazing rapidity into the farming districts, especially in grain-raising sections, where, because of their attacks on ripening grain, they soon became a serious pest. Before 1875 the species is said to have reached the Pacific coast at San Francisco, and then it rapidly over-ran the inhabited regions of the United States and Canada. Its

[1] Sushkin, Peter P.: Bulletin, American Museum Natural History, No. 57, 1927, pp. 1–32.

[2] Forest and Stream, Vol. VIII, 1877, p. 165.

[3] Barrows, W. B.: The English Sparrow in North America, United States Department of Agriculture, Division of Economic Ornithology and Mammalogy, Bulletin 1, 1889, pp. 17–21.

numbers increased so fast that the cities did not furnish a sufficient food supply, and so it spread into the country. Wherever it appeared in large numbers it speedily became a nuisance and a pest, destroying small garden crops, grain and fruit, and driving out useful indigenous birds. As the Sparrows became more numerous they mobbed and killed many native birds, and destroyed their nests, eggs and young. They drove nearly all the smaller hole-nesting birds from cities and villages, as well as many that nested among the branches of trees. Most of the House Wrens, Purple Martins and Cliff Swallows, which had been abundant in southern New England, disappeared, the Sparrows having taken their nests. For example, Mr. B. H. Newell, of City Point, Maine, wrote to me that one female Sparrow took nearly every egg out of thirty-five Cliff Swallows' nests at his place, by merely driving her bill into them and letting them drop from the nests. The interlopers tore down the nests of other birds to get material with which to build their own nests, and in their eager search for linings for their clumsy domiciles they have been known to snatch hair from the back of a live dog. By attacking in numbers the Sparrows were able to kill birds as large as the Robin or the Northern Flicker; when only two or three Sparrows were together, they were more likely to follow a native bird about until, disgusted, it left the neighborhood.

Those who introduced the Sparrow believed that it would clear the city trees of noxious insects. The caterpillars of a geometrid moth (*Ennomos subsignaria*) and those of the spring cankerworm moth (*Paleacrita vernata*) had been stripping the shade trees of city streets and parks. It is claimed that the introduced Sparrows practically extirpated the *Ennomos* caterpillar in New York, Philadelphia and some other cities, but they drove out the native birds that had fed on hairy caterpillars, and hence such larvæ, particularly those of a species then known as *Orgyia leucostigma*, increased so fast that they were quite as destructive as had been those of *Ennomos* or *Paleacrita*.

Later many attempts were made at various times and in many places to exterminate the Sparrows, but without success. Bounties were offered for the heads of the birds. In 1887 Michigan enacted a bounty law allowing one cent apiece for the birds in lots of not less than 25. This law remained on the statute books until 1901, and another was passed in 1905. Professor Walter B. Barrows, of the Michigan State Agricultural College, said that the counties of that state paid out at least $50,000 in 1898 without producing any appreciable decrease in the number of the birds.[1] Poisoning the birds in winter with strychnine has been proved to be the most successful method locally in cities, but this may endanger other birds.

For about 50 years the Sparrows continued to increase and spread, until nearly every village and hamlet in the greater part of North America was occupied by them. In recent years, however, they have decreased in numbers in the cities at least, especially in the northern parts of the country, where their chief food supply in winter formerly was found in the street droppings. With the invention of the automobile and its introduction in place of other vehicles, horses began gradually to disappear from city life, and

[1] Barrows, W. B.: Michigan Bird Life, 1912, pp. 482, 483.

as motor cars increased, Sparrows starved in winter. Ordinarily there is not much nourishment for Sparrows about a motor car, though sometimes when May-flies are abundant they accumulate on the radiators, and Sparrows have been seen to glean them from parked cars. Many Sparrows left the cities for the south or the farming districts, where they became a pest on poultry farms, subsisting largely in winter on "chicken feed." Many are said to have contracted fatal diseases from the poultry. Since the decrease of Sparrows began there has been a corresponding increase in House Wrens, which are now fairly well distributed through a large part of New England. Some other species, particularly Purple Martins and Cliff Swallows, have never reappeared in their former numbers.

Haunts and Habits. The House Sparrow has been introduced into many countries, and wherever it has appeared it has been stigmatized as injurious, pernicious, disreputable, salacious, quarrelsome and even murderous. It has been branded as thief, wretch, feathered rat etc. etc., but whatever may be said about it, the bird certainly is important. During the cycle of its increase in the United States much ink was spilled in denouncing it. Dr. Elliott Coues in 1879 gave a list of more than two hundred titles of articles, most of which were unfavorable to the bird,[1] and many were written in succeeding years. Volumes have been published on the subject, the most important of which is one issued by the United States Department of Agriculture in 1889, on "The English Sparrow in North America," written by Professor W. B. Barrows and containing 405 pages in which the Sparrow is shown conclusively to be a nuisance and a pest. Nevertheless the bird has many friends who feed it and believe it to be a useful species. In any case, it is here to stay and we must make the best of it. It prefers to stay in the neighborhood of human dwellings, for it gets its sustenance chiefly from the products of man's labors in agriculture. Therefore it is almost never seen in great forests or anywhere at any great distance from settlements.

It is a sturdy, upstanding little fowl, aggressive, pugnacious and active. As spring approaches, even while snow still covers the ground, a few Sparrows may be seen carrying straws to their nesting places. Their mating is an occasion for clatter and strife. Three or four males will often attend a single female, fluttering about with spread wings and discordant shrieks, chattering and fighting, both on the ground and in the air, until finally the most vociferous and pugnacious bird secures the prize. The female often shows her regard for the accepted suitor by seizing him by one wing and pulling him about, but he is tough and hardy and seems to like rough treatment, coming from such a source.

John Burroughs tells the following:

"A male bird brought to his box a large, fine goose feather, which is a great find for a sparrow and much coveted. After he had deposited his prize and chattered his gratula-

[1] Coues, Elliott: Department of the Interior, United States Geological and Geographical Survey, Bulletin No. 2, Vol. V, 1879–80, pp. 177–193.

tions over it, he went away in quest of his mate. His next-door neighbor, a female bird, seeing her chance, quickly slipped in and seized the feather; and here the wit of the bird came out, for instead of carrying it into her own box she flew with it to a near tree and hid it in a fork of the branches, then went home, and when her neighbor returned with his mate was innocently employed about her own affairs. The proud male, finding his feather gone, came out of his box in a high state of excitement, and, with wrath in his manner and accusation on his tongue, rushed into the cote of the female. Not finding his goods and chattels there as he had expected, he stormed around for awhile, abusing everybody in general and his neighbor in particular, and then went away as if to repair the loss. As soon as he was out of sight, the shrewd thief went and brought the feather home and lined her own domicile with it." [1]

While this so-called "sparrow" in its wild or semi-domesticated state never utters a musical note, it has, nevertheless, the organs of a song-bird, and if taken young enough can be taught to sing in captivity. It is said, when properly trained, to sing as well as the Canary and even to imitate the song of that bird. Bechstein tells of a Paris clergyman who had two House Sparrows which he had taught to speak and to repeat some of the shorter commandments. It was interesting to observe one of these birds pilfering food from the other, who gravely admonished him meanwhile "thou shalt not steal!"

Both sexes engage in the nest building and in feeding the young. The nest, unlike those of our native sparrows, is often built in roughly globular form — a great mass of heterogeneous materials, largely grass and lined with feathers. It often presents a filthy appearance by the time the young leave it, and it naturally swarms with vermin. When the young become strong on the wing many go into the country districts, where they subsist largely on weed seeds, grass seeds, grain and fruit. Their injurious habits are emphasized in summer and autumn, but they eat grain at any season of the year wherever they can find it. As winter approaches the Sparrows gather into towns, villages and cities. Some find refuge during the severest weather in barns or sheds, in which also they often hide to escape the attacks of the Northern Shrike. They usually roost in sheltered places, such as an open shed, an unoccupied building or among thick ivy vines on large buildings, and in various holes and crevices about buildings and trees. There is more or less migration during the winter, but as a rule the species is rather sedentary, clinging persistently to the locality of its chosen home, and in severe winters many perish in the North from starvation and exposure.

The food of the House Sparrow includes many substances, chiefly vegetal, and ranging from fruit and grain to garbage, and undigested grain and seeds in horse droppings. It eats greedily all the small grains and bird seeds, crumbs of bread, cake and other foods of mankind, small fruits and succulent garden plants in their tender stages. It destroys young peas, turnips, cabbage and nearly all young vegetables, and it often eats the undeveloped seeds of vegetables. When numerous it attacks apples, peaches, plums, pears, strawberries, currants and all other common small fruits. During the early part

[1] Burroughs, John: Locusts and Wild Honey, 1907, p. 33.

of the season before seeds ripen, it takes many insects, and feeds many more to its young. Its insect food includes several injurious caterpillars such as are eaten by most native birds and some destructive moths and beetles.

Economic Status. The food of the House Sparrow has been investigated in several countries and the results of these investigations, so far as I am aware, are similar. The bird is declared to be one of the comparatively few injurious species of the world. Its only saving virtue from man's point of view is the destruction of a small proportion of injurious insects. At times it eats many cut-worms, including the notorious army-worm, and there are a number of instances on record where, because of its great numbers, it has much reduced invasions of certain insect pests. In "The English Sparrow in North America" by W. B. Barrows, there is given (pp. 111–123) an account of the food materials found in a large number of stomachs of the species examined by that eminent entomologist, the late Dr. C. V. Riley of the United States Department of Agriculture. He found that most of the insects taken were harmless species, and that the good done by destroying a few injurious orthoptera and lepidoptera was about counterbalanced by the number of beneficial insects destroyed. This investigation, however, was made in 1887. Since that time the House Sparrows in New England have decreased much in numbers, and apparently they now destroy more injurious insects and fewer of the products of agriculture per bird than they did in the days of their abundance, when much more of their preferred food in the streets was available. In their present numbers they are not so destructive to fruit or to native birds as they formerly were, but recent reports indicate that they still retain habits like those of their forbears, the undesirable reprobates that invaded this country in the nineteenth century. In city and suburban gardens they continue to consume young plants, such as corn, peas and lettuce as soon as their shoots appear above ground.

Poœcetés gramíneus gramineus (Gmelin). Vesper Sparrow.

Other names: BAY-WINGED BUNTING; GRASS FINCH; GROUND-BIRD.

Plate 68.

Description. — Outline of conical bill nearly straight, nostrils naked; wings longer than tail, which is slightly forked, tertials rather long; hind claw much shorter than its toe, as in most sparrows. *Adults (sexes similar)*: Grayish-brown or brownish-gray above, streaked with dusky and with brown-edged feather-centers; narrow eye-ring (and sometimes line over eye) whitish; dark spot below ear-coverts and dark streak below eye forming with two streaks below it a triangle; lesser wing-coverts chestnut, rusty or cinnamon, other wing-coverts colored as back; two inconspicuous buffy wing-bars; flight-feathers and tail-feathers very dark brown, edged light brownish or buffy, these edges broadest on tertials; outer tail-feather entirely or mostly white, and one or two others on either side partly white; below dull white (usually tinged buffy in streaked areas) thickly marked with dusky brown-edged streaks on breast, sides and flanks; bill dusky or brownish above, pale yellowish to flesh-color below; iris brown; legs and feet flesh-color, sometimes tinted yellowish; both sexes paler in spring than in autumn. *Young in first winter plumage:* Virtually as adults. *Young in juvenal plumage:* Similar to adults, but

plumage of looser texture, chestnut and cinnamon of lesser wing-coverts streaked dusky, much more streaked below, light margins of tertials broader, and white of tail restricted; "bill and feet dusky-pinkish-buff, becoming darker" (J. Dwight).

Measurements. — Length 5.50 to 6.70 in.; spread 10.00 to 11.15; folded wing 2.80 to 3.40; tail 2.25 to 2.75; bill .40 to .49; tarsus .68 to .82. Weight about .90 to 1.00 oz. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by post-juvenal body molt (late August, September), juvenal wings and tail retained; first breeding plumage results from wear; adult winter plumage acquired by complete postnuptial molt (August to early October); adult breeding plumage by wear as in young bird.

Field Marks. — Song Sparrow size; a grayish-brown streaked sparrow; chestnut lesser wing-coverts and white outer tail-feathers (the latter easily seen as the bird runs along the ground or flies before the intruder) are diagnostic; no other common summer bird of this size shows such white outer tail-feathers. The Meadowlark which shows white outer tail-feathers is much larger, and the Slate-colored Junco much darker.

Voice. — Alarm note a *chip*, not a *chenk* like that of our other common ground bird, the Song Sparrow; song, two long low notes, succeeded by two higher ones, then descending in chippering trills (E. H. Eaton); rather louder and clearer than that of Song Sparrow.

Breeding. — Usually in open uplands, such as hilly fields and pastures. *Nest:* Sunk in a depression in dry ground, often beside a clod, tuft of grass or weed, but often without shelter, or on ground in tussock or bunch of weeds; built of dry grass and rootlets, and lined with finer material of same. *Eggs:* 4 to 5; .76 to .88 by .58 to .65 in.; ovate; pale greenish-white to grayish-white, marked with dots and blotches of different shades of reddish and purplish-brown, sometimes with blotches of black, and usually with eccentric lines and scrawls of umber or blackish, most markings concentrated around large end; figured by E. A. Capen in "Oölogy of New England," Plate VIII, Figs. 9–12. *Dates:* April 15, June 10, August 11, Massachusetts; late May to June 24, late July and August, Maine. *Incubation:* Period 11 to 13 days (F. L. Burns); chiefly by female, but both have been seen on nest. Two broods yearly in many cases, probably even three sometimes.

Range. — Eastern North America west to the Great Plains. Breeds in lower Canadian, Transition and Upper Austral zones from southeastern Saskatchewan, southern Manitoba, southern Ontario, southern Quebec and Cape Breton Island (Nova Scotia) south to eastern Kansas, central Missouri, Kentucky, eastern Tennessee and North Carolina and west to eastern North Dakota and eastern Nebraska; winters from Arkansas, southern Indiana, southern Pennsylvania, southeastern New York, southern Connecticut, Rhode Island and southeastern Massachusetts to northern Tamaulipas, central Texas, southern Louisiana and southeastern Florida; casual in the Bermuda Islands and Yucatan.

Distribution in New England. — *Maine, Vermont and New Hampshire:* Common migrant and summer resident in open lands, rare in forested lands and absent from highest elevations. *Massachusetts, Rhode Island and Connecticut:* Common migrant and summer resident in open lands; rare winter resident in southern coastal regions.

Season in Massachusetts. — March 11 to November 30 (winter).

Haunts and Habits. Mid-March has passed and winter seems to have departed. Where but yesterday the eye swept the unbroken snowy mantle of the hills, the earth now lies bare and sodden, with here a faint vernal tinge and there a little patch of snow. Swollen streams rush murmuring to the sea. Robust Robins flutter among the crimson sumac berries, taking toll of the supply of fruit, dried on the stem. A Bluebird warbles his soft love song as he flutters from tree to tree in the old orchard, and far away, from the hill pasture, comes an "earth-song," a pastoral plaintive and sweet, the fine strain of the Vesper Sparrow.

PLATE 68

PLATE 68

VESPER SPARROW
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HENSLOW'S SPARROW
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GRASSHOPPER SPARROW
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IPSWICH SPARROW
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SAVANNAH SPARROW
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Louis Agassiz Fuertes.

In "Our Birds in Their Haunts," the Rev. J. H. Langille writes as follows of the song of this little poet of the fields:

"The melody of the Bay-wing, if not so sprightly and varied, still bears quite a resemblance to that of the Song Sparrow, and is expressive of a tender pathos, which may even give it the preference. It is one of the few bird-songs which might be written upon a musical staff. Beginning with a few soft syllables on the fifth note of the musical scale, it strikes several loud and prolonged notes on the eighth above, and ends in a soft warble which seems to die out for want of breath, and may run a little down the scale. Though the song is not brilliant, and rather suggestive of humble scenes and thoughts, 'the grass, the stones, the stubble, the furrow, the quiet herds, and the warm twilight among the hills,' it is nevertheless a fine pastoral, full of the sweet content which dwells in the bosom of nature. It is heard to the best advantage when the rosy hues of sundown are tinting the road, the rocks, and all the higher lights of the evening landscape. Then an innumerable company of these poets 'of the plain, unadorned pastures' — some perched on the fences, some on weeds and thistles, but many more hid in the grass and stubble — swell into their finest chorus, while most other birds are gradually subsiding into silence. It has been well said that the farmer following his team from the field at dusk catches the Bay-wing's sweetest strain, and that a very proper name for it would be the Vesper Sparrow."

John Burroughs describes the song as "two or three long, silver notes of rest and peace, ending in some subdued trills and quavers."

Although the Vesper Sparrow is a ground bird it may be seen commonly in trees, on fences, telegraph or telephone wires, and even on roofs of buildings, especially during migration, and in the love season its rapture sometimes lifts it into the air on fluttering wings, occasionally to a considerable height, where it pours forth its sweetest music ere it drops again to earth. Its lay is most frequent in early morning and near sunset, but may be heard intermittently at any hour of the day, until the night shuts down, and even in dense darkness. The name Vesper Sparrow was, I believe, first proposed for it by Wilson Flagg, and refers to its evening song. It seemed so appropriate that it was finally adopted by the American Ornithologists' Union.

Usually the bird does not become common in the greater part of southern New England until April, and it does not ordinarily build its nest until May, but nests have been found, with eggs, in April. The courtship is carried on mostly on the ground. The male walks or runs before or after the female, with wings raised, and both wings and tail widely spread, occasionally rising into the air to give his flight-song. There is much rivalry and some strife between the males.

In open pastures with short grass the nest is usually sunk in a little hollow, so that its edge is about level with the surface of the sod. Miss Lucia B. Cutter, of Jaffrey, New Hampshire, found a nest in a hole six inches deep, but this is very unusual. This nest was not protected or shaded by herbage. When a nest is built in a tussock or a clump of weeds or bushes, sometimes it is raised somewhat above the ground. Occasionally

the little domicile is built among standing grain, and now and then one is found under the shelter of a potato plant. Nest building requires from one to two weeks, as it is frequently delayed by inclement weather. When the nest is completed an egg is laid daily. The female usually sits very closely when incubating, and often does not leave the nest until almost trodden upon, when she flutters slowly along the ground in imitation of a wounded bird. When the young are hatched, the parents eat the broken egg shells; both parents brood the young, which the female shades from the hot sun with partly spread wings, and protects from the storm with her own body. The nest is kept scrupulously clean. The young leave it in some cases in about eight days, but if not molested they are ready to fly in about twelve.

Anyone walking along a country road or through an upland pasture in spring or summer may see the bird, a plain, rather dingy, striped sparrow, running on ahead, flying only when closely approached, and now and then showing its white outer tail-feathers in flight. It is a bird of the drier, upland fields, usually keeping away from houses for the most part, and rather seldom approaching swamps and watersides, but is fond of daily dust baths in country roads. When the young are on the wing, they feed about weedy fields and gardens. Although not so gregarious as blackbirds or longspurs, flocks of 20 to 50 may be seen in migration, which goes on from late September to November in New England, after which only a few stragglers remain, some of whom winter during mild seasons along the south side of Cape Cod, on the Elizabeth Islands, on Block Island and the coast of Connecticut, and a few up the Connecticut Valley as far north as northern Hampden County, Massachusetts.*

The food of the Vesper Sparrow consists of nearly one-third animal matter, chiefly insects, and the rest vegetal, chiefly weed seeds. It is one of the greatest insect eaters among the sparrows, and lives mainly on insects during spring and early summer, including many first-class pests such as weevils, click beetles, grasshoppers, locusts, cut-worms, army-worms and moths of destructive species. A few snails and earthworms are taken, and rather small amounts of grain, mostly waste grain. Weed seeds seem to be preferred to those of grasses.

Economic Status. As the Vesper Sparrow lives in fields, pastures and cultivated lands, its useful habits tend to the advantage of the farmer. It is virtually harmless. Dr. Sylvester D. Judd, who made a rather thorough investigation of its food for the Biological Survey, says "its value to the farmer is beyond question and should secure for it the fullest protection." [1]

Passérculus prínceps Maynard. Ipswich Sparrow.

Other names: GRAY BIRD; PALLID SPARROW; MAYNARD'S SPARROW; SABLE ISLAND SPARROW.

Plate 68.

Description. — Large, pale and robust; bill slenderly conic, outlines nearly straight; wings longer than tail; tertials long, extending to near end of primaries; tail nearly even or very slightly forked;

* Mr. Aaron C. Bagg records three birds, at Holyoke, Massachusetts, during the winter of 1920.

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, p. 58.

feet slender, hind claw shorter than its toe. *Adults in breeding plumage (sexes alike)*: Above pale grayish or grayish-brown; top of head and back streaked pale brownish (feather-edges) and dark brown (feather-centers); a narrow, inconspicuous, median crown streak of pale buffy-gray or buffy-whitish, a still whiter stripe down lower jaw and a dark one below it, bounding throat; a very distinct stripe over eye and narrow eye-ring, yellow; ear-coverts grayish, tinged rusty; wings generally blackish-brown, scapulars, coverts and secondaries broadly margined pale rusty; broad brown margins of greater coverts often form a noticeable patch across center of wing; edge of wing white, tinged pale yellow; tail-feathers with brownish centers and light edges and tips; below white, tinged on sides and sometimes across upper breast with pale brownish-buff and streaked with brown, the streaks darkest along feather-shafts and palest at edges; usually a clustering of streaks on the breast, forming a large spot as in Song Sparrow or Savannah Sparrow; wing linings mostly whitish; bill dark brown or blackish above, paler below; iris brown; legs and feet pale brownish or dull pinkish-straw-color. *Adults in winter plumage:* Grayer than in breeding plumage, owing to broad ashy feather margins, streaks more suffused and paler, the yellow stripe above eye very pale yellow or ashy-white and bird more buffy below; margins of greater wing-coverts and tertials more rusty. *Young in first winter plumage:* Virtually as winter adults. *Young in juvenal plumage:* Similar to adults, but more rusty and buffy above, and more buffy below, lacking the yellow in pale stripe over eye; colors more suffused and edge of wing around bend white; "bill and feet pinkish-buff, the former becoming dusky, the latter slightly browner with age" (J. Dwight).

Measurements. — Length 5.87 to 6.75 in.; spread 9.50 to 11.20; folded wing 2.79 to 3.30; tail 2.18 to 2.60; bill .40 to .52; tarsus .85 to 1.00. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August) involving body plumage and apparently wing-coverts but juvenal wings and tail retained; first breeding plumage by partial prenuptial molt (February, March) involving head, throat and part of breast and a few feathers elsewhere, but not wings or tail; adult winter plumage by complete postnuptial molt (August); adult breeding plumage by partial molt as in young, more limited in female than in male (J. Dwight).

Field Marks. — A large robust sparrow, near size of Bluebird; colors very pale or pallid, matching very well the color of dry sand; two pale wing-bars; in spring a prominent yellow stripe above eye.

Voice. — Alarm note a sharp, dry *tsip*, like that of Savannah Sparrow; song also like that of Savannah Sparrow but "more polished and tuneful," "keyed a little lower and finished up with more of a trill" (J. Dwight). The song has been graphically represented as "*tsĭp- | tsĭp- | t's | ē'- | ē- | ē- | ē- | pr-rē'-ē-ăh*" (J. Dwight), ending much like the *tee-arr* of the Common Tern.

Breeding. — Among sand dunes on Sable Island off the coast of Nova Scotia. *Nest:* On ground, in hollow in sand excavated by the birds, in grass, under bushes, or under some other shelter; composed of weed stalks, coarse grasses and sedges, moss, dried eelgrass, etc., lined with fine dry grasses and horse or cow hair. *Eggs:* 4 or 5; .73 to .91 by .57 to .64 in., thus a little larger than those of Savannah Sparrow; ovate to long ovate; very variable, bluish or grayish-white, often so washed with brown as to appear olive-brown, usually so splashed and sprinkled with spots and blotches of different shades of umber as to conceal ground color, some less conspicuous grayish-brown and purple markings, sometimes markings are grouped as a ring around large end. *Dates:* May 20 to early June. *Incubation:* No data.

Range. — Central and southern Atlantic coast of North America. Breeds so far as known only on Sable Island, Nova Scotia; winters from Sable Island southward along the Atlantic coast to Georgia.

Distribution in New England. — *Maine and New Hampshire:* Rare local migrant coastwise; may winter rarely. *Massachusetts, Rhode Island and Connecticut:* Common to rare local migrant and rare winter resident coastwise. Casual or accidental in the interior of any New England state, but has been reported at Lake Umbagog and in the Connecticut Valley.

Season in Massachusetts. — (September 10) October 4 to April 20 (May 11, 15). "Winter visitor, locally common and at times abundant in autumn and early winter, very rare in late winter, and uncommon in spring" in Essex County, Massachusetts (C. W. Townsend).

History. The first Ipswich Sparrow recorded anywhere was shot by Mr. Charles J. Maynard, on December 4, 1868, at Ipswich, Massachusetts. The capture was announced in the "American Naturalist" for December, 1869 (p. 554), as that of a Baird's Sparrow, because of a mistake by Professor Spencer F. Baird, who undertook to identify the bird, and it was listed as such in Maynard's "Naturalist's Guide," published in 1870. Later, when two more specimens had been taken, it was described by Maynard in the "American Naturalist" for October, 1872 (p. 637), and named "*Passerculus princeps*, the large barren ground sparrow." Many years before, however, Alexander Wilson had figured the species as the male of the Savannah Sparrow. The bird is now generally known as the Ipswich Sparrow, but its breeding place was not definitely known until May, 1894, when Dr. Jonathan Dwight, Jr., visited Sable Island, Nova Scotia, and found it breeding there. It is not known to breed elsewhere.

Mr. Maynard himself thus describes his discovery of this interesting bird:

"The Ipswich Sand-hills, where the specimen was procured, is a most peculiar place. I have never met with its equal anywhere. Years ago these Sand-hills, which are three miles long by three-fourths of a mile across, and contain about one thousand acres, were covered with a thick growth of pine-trees. Protected by these trees, and among them, dwelt a tribe of Indians, whose earlier presence is indicated, not only by tradition, but by numerous shell heaps scattered over the Sand-hills at irregular intervals. Indeed, even now the ashes of camp-fires may be seen, apparently fresh. Upon the advent of the white man, the usual event transpired, namely, the disappearance of the trees; and today, with the exception of a few scattering ones at the southeasterly corner, near the house of the proprietor of the Sand-hills, Mr. George Woodbury, not a tree is to be seen. All is bleak and barren. The surface of the ground, once covered with a slight deposit of soil, has become a mass of shifting sands. . . . The Sand-hills, in places, are covered with a sparse growth of coarse grass, upon the seeds of which, as I have remarked elsewhere, thousands of Snow Buntings feed. There are, in some places, sinks or depressions with the level of the sea. In these sinks, which, except during the summer months, are filled with fresh water, a more luxuriant growth of grass appears. Walking, on December 4, 1868, near one of these places, in search of Lapland Longspurs, I started a sparrow from out the tall grass, which flew wildly and alighted again a few rods away. I approached the spot, surprised at seeing a sparrow at this late day so far north, especially in so bleak a place. After some trouble I again started it. It flew wildly as before, when I fired, and was fortunate enough to secure it." [1]

Haunts and Habits. The Ipswich Sparrow lives within sound of the breaking sea. Wherever I have seen it, my ears have been filled with the roar of pounding surf, and the bird has always been within a fourth of a mile of the outer beach. Though such has been my experience, a few reports of the bird in the interior of New England have been received. If they are authentic, it seems not improbable that during migration a few may

[1] Maynard, C. J.: The Naturalist's Guide, 1870, pp. 115, 116.

be driven inland now and then by some easterly storm. It is really at home only in treeless coastal lands, along the beaches and among the dunes. Sandy beaches backed by dunes are its favorite resorts, but it may be found also on narrow sandy beach ridges or barren beaches by the sea, where there are no real dunes. I have seen it near the edge of the woods, but never in a tree, and though it has been known to alight in one, it is usually seen, if seen at all, either in flight or on the ground. It feeds chiefly among the grasses and weeds of the dunes. When followed, its colors so blend with the sand that it easily keeps out of sight, except when startled. Then it starts up quickly and flies swiftly and rather erratically for a short distance and alights on the ground again in the concealing grasses. An observer, working cautiously and slowly, however, may now and then obtain a fair view of the bird.

My best opportunity to observe it at leisure was on the long sand spit known as Duxbury Beach where there are several gunning stands or "goose blinds" as they are denominated by the natives. There on a Sunday in early January, at one of the blinds where the gunners were accustomed to feed the small birds, an Ipswich Sparrow was as tame and confiding as one could wish, and it gazed inquiringly at visitors only a few yards away. The bird had become accustomed to the sound of guns and the presence of men and as there was no Sunday shooting, the day offered an excellent chance to view the bird without disturbing the gunners or their game.

Dr. Jonathan Dwight, Jr., in his interesting monograph on "The Ipswich Sparrow and Its Summer Home" (1895, pp. 34–36), writes as follows of the habits of this bird:

"On Sable Island, as might be expected, they were comparatively tame, although even there not permitting a very close inspection. They watch you, especially when singing from the tops of the sand-hills or the bushes, with evident suspicion, and as there is no cover they are not easily stalked. When you approach, they become restless, repeatedly crouching down as if about to fly, bobbing up again, and, finally, either slipping quietly down the opposite side of the sand-hill, or more frequently standing their ground until you are within a few yards. Meanwhile their uncertainty of mind is voiced by occasional sharp chirps, and presently they suddenly depart with brisk, undulating flight, following the inequalities of the ground until hidden by a distant hill. If pursued from place to place, they soon become very wary and will fly until they are nearly out of sight before alighting. . . .

"They most frequented the vicinity of the ponds, and abounded towards the eastern end of the island where the hills and valleys are most extensively clothed with the Crowberry and the Juniper, in the many snug nooks and pockets of which they hide away their cosy nests or find refuge at night from the penetrating, fog-laden air. . . .

"I well remember the first morning on the island. The sun was feebly struggling with the drifting fog that dimly revealed the treeless, ragged sand-hillocks stretching away into the distance; the air was chill, and all about me were strange sights and sounds. Amid the chorus of unfamiliar notes I soon detected those for which I had traveled far, and spied an Ipswich Sparrow singing away on an adjacent sand-peak, quite unconscious

of the sensation he was creating. . . . It was gratifying to know that the bird really could sing, for it is one of the most silent of our winter visitors, its sole note being a sharp, dry *tsip* uttered on rare occasions. . . . This sad little chant is repeated several times in the minute, but rarely for more than a few minutes at a time, when the singer either seeks a new perch or devotes himself for an indefinite period to the quest for food. They sing at irregular intervals, the favorite hour being at dusk, when you may often hear round about you as many as five or six, each pouring forth his mournful trill which seems in perfect keeping with the somber surroundings. They are also more musically inclined in the early morning hours. They sang regardless of the fog, to which they are so well accustomed, nor did they, as is the wont of many birds, greet the sun as it now and again pushed aside the fog curtains with its long yellow rays. Bright days did not inspirit them, nor did dull ones depress them. . . . Wrapped in my coat, I have plodded along, so shut in by the cold sheets of streaming fog that I could only liken my surroundings to the sand-hills of our own coast during a winter's snowstorm, and have listened in vain for some sign of the presence of the Sparrows which I felt sure were in my vicinity. Presently one is discovered walking about on the ground in search of food, and a few minutes later he mounts a brown hummock, throws back his head, and breaks into song. Others, far and near, promptly join in chorus, and for several minutes the air fairly rings with answering songs. Then ensues a period of such perfect silence, ten, fifteen, twenty minutes, that it is hard to believe there is a single bird within earshot. If, however, you will have patience, the chorus will very possibly begin again."

Dr. Charles W. Townsend, who knows this species intimately through much experience with it at Ipswich, Massachusetts, writes as follows regarding its habits while with us:

"The best place to watch them is on the beach, where the view is unobscured by grass. The beach is one of their favorite feeding places, particularly in the sea-weed or "thatch" thrown up there. Except in the coldest weather, this attracts many insects and not only are the insects found in the stomachs, but the birds may actually be seen to catch them. I have even seen them jump into the air for an insect. Beetles and small flies are the chief kinds found. The bird is a walker and runner, rarely hopping, thus differing from the Savanna Sparrow which, although a runner, prefers to hop rather than to walk. An Ipswich Sparrow that I watched continuously for three quarters of an hour at a distance of a few yards, hopped but twice and then only when jumping from a slight elevation. In walking, it moves its head and shoulders in a dove-like manner. In running, the head is held low, so that the top of the head, back, and tail are parallel with the ground. Ipswich Sparrows may occasionally be seen to scratch, and they scratch vigorously, making the litter fly. I have thought that they did this with the two feet alternately, but so quickly as to seem to scratch with both at once like many of the other Sparrows, but of this I am not absolutely sure. Bearing out this view is the fact that I once saw an Ipswich Sparrow deliberately give one scratch with one foot only. Flirting the tail nervously is frequently indulged in.

"Among the dunes, Ipswich Sparrows often alight on the seed-stalks of the beach-grass to obtain the seeds. They also, at times, alight in the bushes and even on the roofs of the few houses in the dunes. Their flight is a flickering, undulating one like that of the Savanna Sparrow, and like that bird they drop abruptly into the grass with the tail down. Like that bird, also, they frequently chase each other either in sport or anger. They often associate with the other beach- and dune-loving birds, the Horned Larks, Snow Buntings, and Lapland Longspurs. In fact, I have several times seen all four species together and that, too, at close range. Thus on January 12th, 1902, I found a flock of Longspurs, Larks and Snow Buntings with three Ipswich Sparrows feeding together in the Ipswich dunes. Again, on January 24th, 1904, in the space of some ten yards square on the beach at Ipswich, I found ten Horned Larks, four Snow Buntings, two Lapland Longspurs, and one Ipswich Sparrow — a truly notable company. The number of Ipswich Sparrows seen together in the fall sometimes almost constitutes a flock. Thus on November 21st, 1903, I saw four at Ipswich Beach within a space of a square yard, and on another part of the beach, six scattered birds within twenty yards of me. On December 6th, 1903, I noted some nine Ipswich Sparrows on the beach all within the space of a few yards." [1]

The summer food of the Ipswich Sparrow, according to Professor F. E. L. Beal, consists largely of insects, as animal matter constitutes about 75 per cent of the whole. It is comprised of beetles, caterpillars, grasshoppers, ants, bugs, spiders, flies, snails, etc., with some seeds of weeds and grasses. About 57 per cent of the stomach contents in winter is vegetal (largely grass seed with some weed seed), 34.9 per cent gravel and sand, and 7.3 per cent animal.[2]

Economic Status. The Ipswich Sparrow appears to be a harmless species, but of little economic importance.

Passerculus sandwichénsis savánna (Wilson). Savannah Sparrow.

Other names: SAVANNA SPARROW; GROUND-BIRD.

Plate 68.

Description. — Much like Ipswich Sparrow in form and in markings, but smaller, not so robust, darker; tail nearly even or slightly forked. *Adults in breeding plumage (sexes alike)*: Above, including wings and tail, dark brown or blackish, with edges of feathers (excepting those of fore crown) whitish or pale reddish-brown; a middle line of yellowish-white on top of head, running from base of upper mandible to back of head where mixed with dark brown; streak over eye yellow, fading to yellowish behind eye, and narrow eye-ring yellow; lores and ear-coverts more or less dusky; below, including wing linings, white, generally streaked dusky, streaks usually clustering in a spot on upper breast as in Song Sparrow; edge of wing yellow or yellowish; bill brown or dusky, lighter below at base; iris dark brown; legs and feet pale pink or flesh-color. *Young in first winter plumage:* Virtually as adults, though often with more

[1] The Birds of Essex County, Massachusetts, 1905, pp. 262, 263.

[2] Dwight, Jonathan, Jr.: Memoirs, Nuttall Ornithological Club, No. II, The Ipswich Sparrow and Its Summer Home, 1895, pp. 41, 42.

buffy tints. *Young in juvenal plumage:* Similar to adults, but lacking yellow in fore part of stripe over eye, all light parts more buffy and streaks of lower plumage less sharply defined (see Fig. 68).

Measurements. — Length 5.25 to 6.27 in.; spread 7.95 to 9.60; folded wing 2.50 to 3.00; tail 1.81 to 2.25; bill .39 to .49; tarsus .70 to .87. Weight, adult male, .75 oz. (B. H. Warren). Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August) of body plumage and wing-coverts only; first breeding plumage by partial molt (March, April) chiefly on head, throat and breast, but more or less on other parts of body, and including some tertials; adult winter plumage by complete molt (August); adults molt as young, completely in autumn and partially in spring.

Field Marks. — Size somewhat smaller than Song Sparrow, but resembling it, and often mistaken for it; usually has similar but smaller spot on center of streaked upper breast. *Adult:* Distinguished from Song Sparrow by the light streak over eye being *yellow* before eye, and shorter slightly forked tail (Song Sparrow's tail is rounded); legs slender and *pinkish* or flesh-color. The Savannah Sparrow is whiter below than most other sparrows, is darker above than the Ipswich Sparrow and smaller, has no white outer tail-feathers like the Vesper Sparrow; other New England sparrows with streaked breasts and which might be mistaken for it, have rounded tails. *Young:* Juvenal birds lack the yellow above and before eye, and might be mistaken for young of some other sparrows, but general resemblance to their parents should be noted.

Voice. — Alarm note "a sharp *tsip*"; when two are quarreling "a harsh *bss*"; song, *tsip, tsip, tsip, tseeeeeeee tsee-ee-ee-ee* (the *ees* represent trills, the first "grasshopper-like," the second more musical) (R. Hoffmann); occasionally a loud smacking note, and on rare occasions a soft, feeble warble takes the place of a song (C. W. Townsend).

Breeding. — In the interior, on upland or lowland, in grass fields, meadows, pastures or cultivated fields; along the coast among sand-dunes, about the edges of salt-marshes or in marsh near sea beaches. *Nest:* In hollow scratched out by the birds, its edges even with surface of ground or tussock, hidden by overhanging grasses; built of fine grasses, sometimes lined with hair or fine rootlets. *Eggs:* 4 to 6; .76 to .80 by .50 to .60 in.; oval or ovate; greenish-white or bluish-white, spotted and blotched, so as often to conceal ground color, with reddish-brown and often purplish-brown, very variable markings, sometimes massed as confluent ring around large end; figured by E. A. Capen in "Oölogy of New England," Plate VIII, Figs. 5–8. *Dates:* May 21 to June 29, Massachusetts; May 31 to June 18 (July), Maine; May to July, New Brunswick; July 7, James Bay, northern Ontario.* *Incubation:* Chiefly by female. One or two broods yearly in New England.

Range. — Eastern North America. Breeds mainly in Boreal and Transition zones from northern Manitoba, northern Ontario, northern Ungava (Quebec) south to southeastern South Dakota, northern Iowa, southwestern Missouri (casually), Illinois, northern Indiana, southern Pennsylvania, northern and eastern New Jersey (rarely), southeastern New York and Marthas Vineyard (southeastern Massachusetts); winters from southeastern Kansas, southern Illinois, southern Indiana, southern Pennsylvania, eastern New Jersey, southeastern New York, Connecticut, Rhode Island, Massachusetts and (casually) southern Maine to Tamaulipas, northeastern Mexico, southeastern Texas, southern Alabama, southern Florida, the Bahama Islands and Cuba; westward in migration to eastern Nebraska; casual in the Bermuda Islands.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common migrant and summer resident, most abundant coastwise; accidental coastwise in Maine in winter. *Massachusetts, Rhode Island and Connecticut:* Common migrant and summer resident; rare winter resident coastwise.

Season in Massachusetts. — March 26 to November 12; winters more or less regularly, mostly on southerly coastline and sea islands.

* According to Dr. T. M. Brewer, eggs were found by William Brewster at the foot of Mount Washington, New Hampshire, as late as the "first of August" (Baird, Brewer and Ridgway, A History of North American Birds, Land Birds, Vol. I, 1905, p. 535).

Photograph by Miss Cordelia J. Stanwood

FIG. 68. — SAVANNAH SPARROW IN JUVENILE PLUMAGE

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Photograph by C. E. Leister

FIG. 69. — GRASSHOPPER SPARROW, NEST AND EGGS

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HAUNTS AND HABITS. The Savannah Sparrow is named in remembrance of the broad savannas of the southern seaboard, which it frequents in winter. It is seen commonly in low, moist, grassy lands or dryer lands near water, such as beaches or sand-dunes along the sea-coast. It is common about salt-marshes and river meadows, and follows river valleys into the interior, and even into the mountains, and breeds not only in the valleys but in the hills. It is most abundant, however, along the coast and in wide river valleys.

It is essentially a ground bird. It feeds, nests and sings on the ground, but it is by no means entirely terrestrial. As a boy I had read that this bird never alighted in trees. Therefore I was surprised to see a small flock of migrants fly into a tree and alight as skilfully as any other sparrow. Since then I have seen them alight on telegraph and telephone wires, trees and bushes, and they commonly alight on rocks and stumps near their nesting places, and from such lowly watch-towers they now and then send forth their rather insect-like songs; occasionally one sings in flight. Most of those that breed in New England arrive from the south in April and are not often noticed by human eyes, as they search among grasses and weeds for their insect food. When flushed they fly swiftly away in undulating, zigzag flight and drop quickly into the grass. Both bird and song are so inconspicuous that most people seldom notice either.

When this sparrow first arrives from the south it is songless or sings very feebly, but as the May days come it bursts into full song, though even then its musical efforts do not greatly exceed those of a grasshopper. As the courtship season arrives two males may be seen occasionally engaged in a running fight, in which there is usually much more running than fighting. Dr. Charles W. Townsend says: "In courtship the male stands on the ground and vibrates his wings rapidly above his back. He also flies slowly a short distance above the ground with head and tail up and rapidly vibrating wings." [1]

Both sexes engage in building the nest, incubating the eggs and caring for the young, but the female takes upon herself the greater part of the family cares. She sits closely, but when almost trodden upon by some clumsy intruder, she seeks to lead him away from her treasures by the common artifice of fluttering along the ground, dragging a leg and wing in imitation of a disabled bird.

When the young become strong on the wing, the birds gather in family groups and roam the fields and meadows. They know the art of concealment and can run rapidly close to the ground, with heads carried low, and thus they speed along for rods, keeping well under cover. When the August molt has passed, they become rather less shy and retiring, and as migration begins they may be found in upland pastures, weedy fields, orchards and gardens, where they gather the ripening seeds of weeds, as well as in meadows and marshes. In October most of them leave New England for the south, but some remain until November, and a few pass the winter along our southern coasts.

The food of this sparrow consists mostly of grass seeds, weed seeds and insects. Along the coast it takes also some small forms of marine animal life that it finds among

[1] Supplement, Birds of Essex County, Massachusetts, 1920, p. 143.

the eel-grass washed up on the beaches. Dr. Sylvester D. Judd examined the stomach contents of 119 birds of this species and found the animal food ratio to be 46 per cent and the vegetal matter 54 per cent. The animal food was almost wholly insects and the vegetal food mostly seeds of weeds and grasses and a few blueberries. No grain was found.[1] Mr. Wendell P. Smith, of Wells River, Vermont, reports that he saw one eating potato beetles.

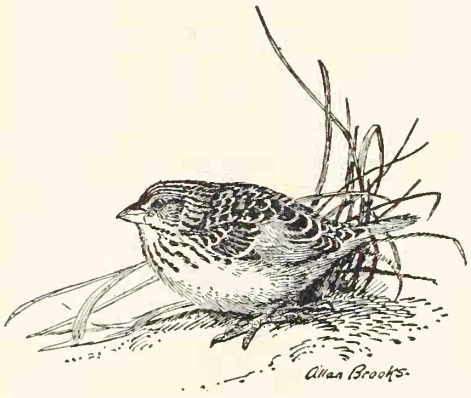
Economic Status. Dr. Judd says that judging from his examination of its food habits, the Savannah Sparrow is an exceedingly valuable bird. Mr. Arthur T. Wayne says that the species is sometimes destructive to sprouting rice in South Carolina.[2]

Ammódramus savannárum austrális Maynard. Grasshopper Sparrow.

Other name: YELLOW-WINGED SPARROW.

Plate 68.

Description. — Bill stouter than that of Savannah Sparrow, wing and tail shorter, wing with inner secondaries and longest tertials extending to near tip; tail *double rounded*, middle feathers shorter than the next, outer feathers but little shorter than the middle ones, feathers rather pointed; feet rather large and strong. *Adults in breeding plumage (sexes alike)*: Above variegated, spotted and streaked with black or blackish, gray, buffy and rusty or chestnut-brown; top of head streaked finely with black, with a distinct middle stripe of buff or brownish-yellow; hind neck grayish, streaked or spotted chestnut; sides of head buffy, inconspicuously and sparsely marked dusky, a yellowish spot or stripe extending from bill over eye and a very narrow dark line behind eye, two very narrow obsolete stripes outlining jaw, sometimes absent; lesser wing-coverts greenish-yellow, tips paler, basal parts blackish; rest of wing-feathers dusky centrally with pale edges and tips, these markings particularly prominent on tertials, which with greater coverts are tipped still paler or whitish; *edge of wing bright yellow;* tail with dusky feather-centers and broad buffy or brownish-yellow margins; outer tail-feathers largely of the lighter tint; below buffy, fading to whitish on lower breast and posterior under plumage; iris dark brown; "bill pale bluish, ridge dusky; legs and feet flesh-color, claws light brown" (N. S. Goss). *Adults in winter plumage:* Similar to breeding plumage but brighter colored, less black and more chestnut above, more buffy below, and throat and upper breast sometimes faintly streaked with chestnut or cinnamon. *Young in first winter plumage:* Like adult in winter, but buff less obvious above and colors deeper, breast strongly tinged buffy and with obsolete darker streaks. *Young in juvenal plumage:* Much like adults above; scapulars tipped with russet spots; central tail-feathers have peculiar fused barring along shafts; below white, streaked on upper breast and lower throat and faintly on sides with dark brown; "bill and feet pinkish-buff, the former becoming dusky, the latter deep brown when older" (J. Dwight).



Grasshopper Sparrow, Juvenile.

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 60, 61.

[2] Wayne, Arthur T.: Birds of South Carolina, 1910, p. 118.

MEASUREMENTS. — Length 4.80 to 5.40 in.; spread 8.00 to 8.50; folded wing 2.25 to 2.60; tail 1.80 to 2.00; bill .42 to .49; tarsus .75 to .80. Female smaller than male.

MOLTS. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by complete postjuvenal molt (August, September); first breeding plumage by partial prenuptial molt (April) chiefly about head, and by wear; adults have one complete postnuptial molt (August, September) and a slight prenuptial molt in spring as in young.

FIELD MARKS. — Size near that of Chipping Sparrow. Characterized by rapid, fluttering, wren-like flight close to ground. *Adults:* Differ from all common sparrows of the grass fields by their buffy unstreaked throats and breasts; a little yellow above and before eye. *Young:* Similar to adults, with streaked backs, but breasts also spotted or streaked with dusky, thus resembling Henslow's Sparrow, which is somewhat similarly marked.

VOICE. — Common call, *tillie;* song *tsick, tsick, tsurrrrrr,* like the stridulation of the green grasshopper (*Orchelium vulgare*) (R. Hoffmann); a "couple of halting notes, preceding a long wheezy buzz" *pit tuck zee-e-e,* a longer song, *pit tuck zee-e-e-e zeedle-zee-e-e, zee-zeedle-zee-e-e-e, zee, zee-zeedle-zee-e-e-e,* duration 10 seconds (S. L. Thompson); a longer song given in the breeding season has a rolling trill toward the end.

BREEDING. — In grassy fields and pastures and occasionally on cultivated land, but not in marshes or other wet lands. *Nest:* On ground, usually sunken so that the edge is even with ground level, and concealed in or under a tuft of grass or some other cluster of wild or cultivated plants, such as potatoes or strawberries; built mostly of dried grass and usually lined with hair or fine rootlets. *Eggs:* 3 to 5, rarely 6; .65 to .78 by .53 to .60 in.; rounded oval or ovate; pure glossy white, sometimes tinged greenish or brownish, rather sparingly spotted and blotched, usually toward large end (where often a ring of spots is formed around it), with purple or lilac and browns, both light and dark; figured by E. A. Capen in "Oölogy of New England," Plate VIII, Figs. 13–15. *Dates:* May 20 to June 1, Virginia; May 23 to August 22, Connecticut; May 30 to June 5, Rhode Island; July 17, Vermont. *Incubation:* By both sexes. Usually one brood yearly in New England; often two in more southern states and possibly also in Connecticut. (See Fig. 69.)

RANGE. — Southeastern Canada, eastern United States, the West Indies and eastern Mexico. Breeds in Austral and occasionally Transition zones from southern Michigan, southeastern Ontario, central New York, northern Vermont, central New Hampshire and southern Maine south to southern Alabama, Georgia and probably Florida; winters from central Alabama and South Carolina to Yucatan and Chiapas in southeastern Mexico, Cozumel Island, Cuba and the Bahamas.

DISTRIBUTION IN NEW ENGLAND. — *Maine:* Rare summer visitor along the seaboard, but not known to breed. *New Hampshire:* Rare summer resident on lower uplands in southern part. *Vermont:* Rare summer resident of southern and western valleys, recorded north to St. Johnsbury. *Massachusetts:* Generally uncommon local summer resident, but common in some localities. *Rhode Island:* Common local summer resident. *Connecticut:* Common local summer resident, most common on the seaboard and in the Connecticut Valley.

SEASON IN MASSACHUSETTS. — (April 25) May 1 to September 1 (November 22, December 6 and 10).

HAUNTS AND HABITS. The Grasshopper Sparrow is a queer, somber-colored, big-headed, short-tailed, unobtrusive little bird. It did not come by its name because of its fondness for grasshoppers, though it is never averse to making a meal of them, but because of its grasshopper-like attempt at song — if song it can be called. It is so persistent and persevering in giving forth its attempts at melody that it not only sings and sings unnoticed during daylight hours, but even awakens in the night to sing. When the novice first hears this stridulation coming out of the grass he naturally ignores it or does not connect it with a bird.

This little sparrow is not so uncommon in Massachusetts as most people believe it to be, but its insect-like song is barely audible at one hundred yards, and if the hearer is at all tone-deaf, he will not hear it at all, even though he passes by the singing bird at a distance of twenty feet. Then again the bird keeps out of sight for the most part and runs through the grass like a little mouse. Also it is very local in its habitat. It may disappear from one town and suddenly appear in another where it was previously unknown. It may be common in one locality and unknown in a similar region near-by. Although I began hunting for birds and collecting their eggs in the suburbs of Boston at the early age of seven years, I never found the Grasshopper Sparrow until I went to Worcester at the age of twelve, and a little later located it in Westborough, where I found its nest in a potato hill. Its white eggs with their rings of spots around the larger end are colored so like warblers', and so unlike those of other ground sparrows, that one has no difficulty in identifying them.

It is a bird of the coastal plain, river valleys and the lower uplands. It is rarely found at levels much above one thousand feet. Although it often nests on rather low ground, even at the edge of salt-marshes, the nest is always on dry land. If in or near a meadow, it is on a rise of ground. It prefers dry, sandy fields and pastures, where the white daisy and the red sorrel grow, and I have never seen one in the woods. It is a ground bird; it eats, nests, sings and sleeps on the ground, but also sings from weed-tops, tussocks, driftwood, stones and fences. Rarely it alights in trees, and sometimes sings from a low tree-top, and in migration it may be seen at times in gardens or orchards.

Its habits are much like those of the Savannah Sparrow, but it may be readily distinguished from that species by its unstreaked breast, the yellow at the bend of its wings, and the rapid, fluttering, wren-like flight close to the ground. It usually flies up from the grass, flutters rather low and erratically for a short distance and drops, apparently exhausted, into the grass again.

It seldom arrives in numbers in interior Massachusetts until the latter half of May, although a few may be seen early in the month. Along the coast it comes earlier, and Miss Elizabeth Dickens records arrivals at Block Island, Rhode Island, from April 2 to 8. My earliest recorded date for southern Connecticut is April 17, by Mr. Aretas A. Saunders.

It builds its nests in late May and June, and I have found two with eggs in July. They are extremely hard to find, as the female almost never flies up directly from the nest and seldom flies back to it, but scurries some distance in the concealment of the tall grass. In running in and out she wears a little path, almost imperceptible, but which may be found by a close observer. If surprised upon the nest she flutters through the grass, feigning lameness. There may be a second brood occasionally in Massachusetts, but the bird comes so late and usually goes so early that such cases, if they occur, probably are rare. The nests are frequently broken up by the mowing machine, and usually a bird leaves a locality after the grass has been cut — sometimes never to return.

When the young leave the nest, they follow the parents about for a while and in July

or early August the southward movement begins. Birds seen after September 1 are mere stragglers. As the seeds of weeds ripen this bird feeds greedily upon them. Now and then it may be seen hovering over a tall weed regarding its fruitful seed crop, then alighting sidewise on the upright stem and reaching out, feasting "to its heart's content." It also feeds much on the ground. The food of the Grasshopper Sparrow, unlike that of some other sparrows, contains a very large percentage of insects. It seems fond of such insect pests as cut-worms, army-worms, grasshoppers and locusts.

Economic Status. Dr. S. D. Judd's examination of 170 stomachs of these birds shows that it is injurious only to the extent of three per cent, neutral 24 per cent, and beneficial 73 per cent. He remarks that this species "seems to be individually the most useful species of bird whose food habits have thus far been investigated." [1]

Passerhérbulus hénslowi henslowi (Audubon). Henslow's Sparrow.

Plate 68.

Description. — Somewhat like *young* of Grasshopper Sparrow, but bill usually heavier, tail not longer than wing and graduated, the outer feathers much shorter than the middle ones, and all very narrow and sharp-pointed. *Adults (sexes alike)*: Above rather buffy or brownish-yellow-olive; hind neck and upper back tinged greenish; top of head with a broad black-streaked stripe on either side, light middle line unmarked, blackish markings down back of neck; back striped with blackish feather-centers, each feather tipped chestnut-brown and bordered light grayish, thus more conspicuously striped above than the Grasshopper Sparrow; tertials, rump and tail-coverts chestnut-brown, the feathers with broad, dark brown centers, lighter brown margins and narrow gray edges; wings and tail tinged chestnut; edge of wing yellow around bend; narrow dark brown or dusky line behind eye, ear region touched with same; a *dark streak from gape back along jaw*, and another (sometimes obsolete) *bordering chin and upper throat;* below light brownish-yellow or buffy, paling on chin, throat and abdomen; lower throat, upper breast and sides still darker and streaked distinctly and narrowly dark brown or blackish; bill brownish, usually darker brown or dusky above, paler below; iris brown or dark brown; legs and feet light brown or yellowish. *Young in first winter plumage:* Similar to adults. *Young in juvenal plumage:* "Above, clay-color, streaked on head and back with black; wings and tail clove-brown, edged with clay-color; secondaries and tertials edged russet, alula with white; below faint primrose-yellow, buffy on chin and throat, unstreaked or an occasional streak at sides of throat" (J. Dwight); a peculiar fused barring along shaft-streak on central tail-feathers.

Measurements. — Length 4.75 to 5.25 in.; spread 6.90 to 7.50; folded wing 2.00 to 2.20; tail 1.75 to 2.10; bill .45 to .58; tarsus .66 to .73. Weight, male .50 oz. (B. H. Warren). Female smaller than male.

Molts. Apparently similar to those of Grasshopper Sparrow (see page 57).

Field Marks. — Size near that of Chipping Sparrow; a short-tailed, large-headed bird like Grasshopper Sparrow, but no yellow before or above eye; hind neck more greenish, back and wings tinged chestnut-brown and light stripes more conspicuous; upper breast distinctly but narrowly *streaked with blackish* (young Grasshopper Sparrow, sometimes mistaken for Henslow's, has breast spotted or streaked); young somewhat similar to parents, but more yellowish above and below, and practically unstreaked below.

Voice. — Usual note (often called the song) a rather feeble *ker-chick'*, *flee-sic'*, *phit-zit*, *tee-wick*, *che-slick*, *see-wick*, *tse-sēēp*, *eherr-r-r-up* or *tililip*, etc., according to the imagination or hearing of the

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 32, 33.

listener; also a "sharp thin *sipp*" (E. H. Eaton); there is a longer song *sis-r-r-rit srit srit* (P. L. Jouy), or *tse-tsee-tsip* (W. L. Dawson).

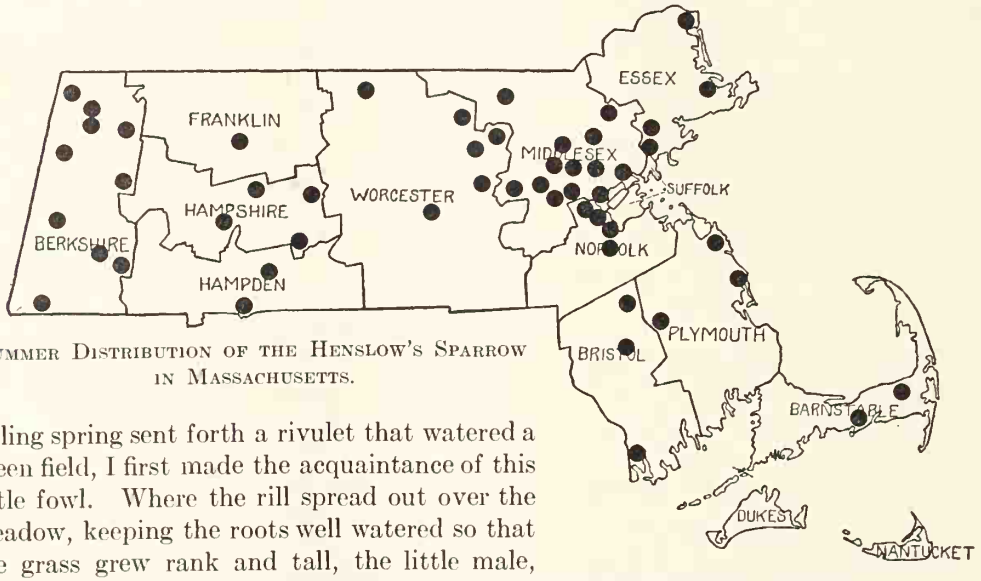
Breeding. — In small swales, meadows or other moist grassy lands, often near borders of shallow lakes or rivers, in fields of heavy timothy or clover, rarely on dry sandy banks. *Nest:* On ground, commonly in tuft of grass and well hidden; built mostly of grass and lined with finer material, hair often used. *Eggs:* Like those of Grasshopper Sparrow and hardly distinguishable from them; figured by E. A. Capen in "Oölogy of New England," Plate IX, Figs. 1, 2. *Dates:* May 30 to June 14, Virginia; June 3, Ohio; May 25 to August 6, southern New England. One brood yearly, probably sometimes two.

Range. — Eastern United States. Breeds in Transition and Upper Austral zones from central New York, central Vermont and north-central New Hampshire south to southeastern Virginia; winters from South Carolina and Alabama to southern Florida.

Distribution in New England. — *New Hampshire:* Rare local summer resident from White Mountain valleys southward. *Vermont:* Rare local summer resident in southern half. *Massachusetts:* Rare migrant; rare to common local summer resident. *Rhode Island:* Rare migrant; rare local summer resident. *Connecticut:* Rather rare migrant; rare local summer resident.

Season in Massachusetts. —(April 1, 8, 26) May 6 to October 14 (November 6).

Haunts and Habits. There is a great green hill east of the city of Worcester, where farmers used to pasture cattle half a century ago, and there at the hill foot, where a never-



Summer Distribution of the Henslow's Sparrow in Massachusetts.

failing spring sent forth a rivulet that watered a green field, I first made the acquaintance of this little fowl. Where the rill spread out over the meadow, keeping the roots well watered so that the grass grew rank and tall, the little male, clinging to the upper grass stems, sent forth his weak but emphatic "*flee-sic*" hour after hour. His mate kept mostly under cover of the grass, stealing along like a tiny mouse, and so well was the nest concealed that I never found it.

Rank grass in moist lowlands seems to be chosen usually by these birds as a nesting place, but Mr. Frank L. Burns records a nest that he found in New Jersey close to the beach "at the brink of a small sand-dune." [1] Usually, I have found the bird on moist

[1] Auk, Vol. XII, 1895, p. 189.

land near water, but in migration or in the South in winter it often frequents dry fields or open piney woods near some sheltering thicket.

Most of the Henslow's Sparrows arrive in Massachusetts in May and depart in August and September. Earlier and later birds are stragglers. There are few northern land birds whose habits are so little known. One who knows its note may find it without difficulty, but its activities on the ground, where it spends most of its time, are well hidden by the waving grass. If pursued it runs swiftly or squats and hides its head under leaves or other vegetation, or it may flutter along close to the ground until it reaches the shelter of some thicket of bushes where it sits motionless and concealed until it believes that all danger has passed. The male is ambitious enough at times to leave his grasses and weed-tops and mount the top of a fence post, from which he delivers that which with him passes for a song; but I have never seen one far from the ground, though they must leave it in migration. Some of the males have the habit of singing, if singing it can be called, after dark; sometimes they sing until midnight, and in some cases nearly all night. Mr. H. C. Denslow writes to me that he timed one, and that the chirps came "eight to the minute" almost without fail. It seems as if the bird must sing in its sleep.

Henslow's Sparrow is probably more common than our information indicates. Anyone but a competent field ornithologist is likely to overlook it, but one knowing its notes, haunts and habits will have little difficulty in finding it. Undoubtedly it has been confused often with the Grasshopper Sparrow. I have been rather surprised to learn how widely it is distributed in Massachusetts in the breeding season. It is very local, and we have not as yet records enough to map fully its distribution, but it seems to be more common in western Massachusetts than in the eastern part.

It feeds mainly on insects and seeds. It eats beetles, cut-worms, grasshoppers, bugs and some berries, but no exhaustive investigation of its food has been made.

Economic Status. Henslow's Sparrow undoubtedly is a useful bird of the fields, but it is not common enough in New England to be of much economic importance.

Passerherbulus caudacútus (Gmelin). **Sharp-tailed Sparrow.**

Plate 69.

Description. — Bill relatively more slender than in any of the foregoing finches and sparrows; wing relatively the same as in last species; tail rounded, its feathers narrow and *sharp-pointed;* feet rather large with long toes; colors rather sharply contrasted; *no bright yellow* before eye. *Adults in breeding plumage (sexes alike)*: Top of head dark brown, streaked black, usually with an indistinct grayish middle stripe; elsewhere above, largely olivaceous shading into umber-brown on upper back and into olive-gray on back and sides of neck; *back conspicuously striped with buff, white or buffy-white;* sides of head rich buff or light burnt-orange, a narrow streak of black behind eye, a dark eyebrow and a gray patch on ear region; greater wing-coverts, tertials and secondaries dusky or blackish-brown with broad margins of rusty, often whitening at ends; primaries brown, narrowly edged lighter, edge of wing pale

yellow; tail-feathers dusky-brown, edged buffy; chin, throat and all lower plumage white, except upper breast, sides and flanks, which are buffy, distinctly streaked and spotted blackish; a narrow dark line bounds each side of throat; bill dusky above, often lighter below; iris dark brown; legs and feet brown or olive-brown. *Adults in winter plumage:* Darker above than in summer, somewhat resembling Seaside Sparrow; general color above brownish-olive-green, light stripes on back gray (not white as in summer); top of head "sepia, faintly streaked clove-brown," with middle stripe gray; patch on nape tinted orange; alula edged white; buff on sides of head and below deeper than in summer, and stripes below more or less veiled by light feather-edges. *Young in first winter plumage:* Similar to adult winter plumage, averaging not quite so bright. *Young in juvenal plumage:* Everywhere rich buff above and below, streaked broadly on back and narrowly on upper breast, sides and flanks with dark brown or blackish, appearing much like "miniature young Bobolink"; tail olive-brown with clove-brown shaft-streaks; edge of wing nearly as yellow as in adult; "bill and feet pinkish-buff, the former becoming dusky, the latter sepia-brown with age" (J. Dwight).

Measurements. — Length 4.80 to 5.85 in.; spread about 7.00 to 8.25; folded wing 2.17 to 2.36; tail 1.90 to 2.13; bill .47 to .59; tarsus .73 to .85. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (September, October), involving most of plumage except primaries and their coverts, and sometimes secondaries; first breeding plumage by complete prenuptial molt (March, April); adult winter plumage by complete postnuptial molt (August, September); adult breeding plumage by complete or nearly complete prenuptial molt as in young. The plumage of these birds is subject to excessive wear among the coarse grasses of the seaside, and adults have each year a complete postnuptial molt and a nearly complete prenuptial molt.

Field Marks. — Length of Chipping Sparrow, but larger, more robust. *Adult:* A large-headed, short-tailed bird, olive-brown above, buffy and streaked darkly across breast and along sides, a blackish cap, light streaks on dark back, buff or burnt-orange surrounding an ashy cheek-patch; in late autumn darker above and more buffy below; readily distinguished from Savannah Sparrow, which, with similar habits, frequents the same haunts, by its short, pointed tail and lack of yellow before eye; Savannah's tail is slightly forked. *Young:* Similar in shape but much more buffy, with dark stripes above and below, like a young Bobolink, but much smaller.

Voice. — Call notes "short *chips* or *chucks*"; song, short and gasping, followed or preceded by two *ticks* which can be heard only when near at hand; resembles "the plunging of hot iron into water," thus "*gshshhh swik wick*" (C. W. Townsend).

Breeding. — About salt or fresh marshes, close by the sea, around estuaries and up river valleys above tide-water. *Nest:* Usually in tussock on ditch bank or among driftwood or dry seaweed, just above high water-mark of summer tides, or in grass in boggy parts of the marsh; built coarsely of dried grass, and lined with fine grasses or similar material. *Eggs:* 4 or 5; .70 to .80 by .55 to .64 in.; greenish, pale bluish or grayish-white, covered with fine brown dots, in some cases coarser, sometimes clustered about large end, many also have purplish or lilac spots; figured by E. A. Capen in "Oölogy of New England," Plate IX, Figs. 3, 4. *Dates:* May 15 to 24, Virginia; May 24 to July 14, southern New England. One brood yearly.

Range. — Salt-marsh regions of Atlantic coast of United States. Breeds from southwestern Maine to northeastern North Carolina; winters coastwise from southeastern New York to Florida, casually north to southeastern Massachusetts.

Distribution in New England. — *Maine:* Rare local summer resident coastwise in Cumberland County. *New Hampshire:* Rare local summer resident coastwise. *Vermont:* Rare migrant. *Massachusetts:* Uncommon to common migrant and local summer resident coastwise; rare in winter. *Rhode Island and Connecticut:* Common migrant; local summer resident, mostly coastwise; rare in winter in Connecticut.

Season in Massachusetts. — May 10 to November 15 (winter).

PLATE 69

PLATE 69

LARK SPARROW
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ADULT

JUVENAL

SEASIDE SPARROW
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SHARP-TAILED SPARROW
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ACADIAN SHARP-TAILED SPARROW
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NELSON'S SPARROW
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Allan Brooks.

HAUNTS AND HABITS. The Sharp-tailed Sparrow is a species of the littoral. It is rarely found far from tidal waters. To see it one must go where the flowing tide comes in. It frequents salt-marshes and little bogs near the sea, and is only local in distribution where such retreats are scarce. It breeds on coastal islands as well as on the mainland. During June and July while nesting and rearing young, the bird is rather shy and hard to flush, as it prefers running on the ground mouse-like and under cover, and if flushed flies low over the reeds for a short distance to the top of a plant or bush, from which it quickly descends again to its favorite cover. I have never heard of one flying high on its breeding grounds or alighting high up in a tree. Its highest flight, except in migration, seems to be a song-flight, which sometimes carries it up a rod or two into the air, when it flies along a bit, delivers its wheezy song, and then drops down again, as if it were trying to trace an inverted U or half-circle in the sunny atmosphere.

Breeding birds begin to appear in Massachusetts during the latter half of May, and most of them have moved south before late October. They are so secretive and keep so much under cover that little is known about their breeding habits. Dr. C. W. Townsend, who has spent much time in following the species at Ipswich, writes as follows:

"The Sharp-tailed Sparrow is one of the most interesting inhabitants of the salt-marshes, on the edges of which it builds its nest in tussocks of grass, raised a few inches to escape the unusual tides, or concealed in the dead 'thatch.' The birds appear to be distinctly social. In some localities several pairs are often found breeding together, while other localities, apparently equally favorable, are deserted. They may be found in all parts of the marshes, but they are particularly fond of the upper or black-grass region.

"Sharp-tailed Sparrows are rather difficult birds to observe, especially if they are vigorously followed, as they then lie close, and when flushed, soon drop into the grass and instantly conceal themselves. If, however, the observer keeps still, the birds often become quite tame and display their interesting habits. They run through the grass like mice, with heads low, occasionally pausing to look around, and stretching up to almost double their running height. They occasionally alight in bushes or small trees, and I have seen them running about a stone-wall near the marsh like mice. They fly low and alight by dropping suddenly into the grass with tails pointed down." [1]

When the breeding season is over the Sharp-tailed Sparrow loses much of its caution and is not so given to skulking out of sight in its marshy cover.

Fifty-one stomachs of this bird, collected from May to October, contained 81 per cent of animal food, of which 26 per cent consisted of spiders, sand-fleas and snails and the rest of insects. This is a considerable proportion of insect food for a sparrow. Among the insects eaten were grasshoppers, crickets, nocturnal moths, leaf-hoppers and many other bugs; these insects, with the exception of some of the predacious bugs, are injurious or potentially so. Nineteen per cent of vegetal matter was found in the stomachs of these birds, consisting chiefly of the seeds of weeds and grasses.[2]

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[1] Birds of Essex County, Massachusetts, 1905, p. 266.

[2] Judd, S. D.: United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 64, 65.

Economic Status. The Sharp-tailed Sparrow lives chiefly in salt-marshes, where probably it is of little economic importance, unless indeed it helps to hold in check insects potentially injurious, which might otherwise attack crops.

Passerherbulus nélsoni nelsoni (Allen). Nelson's Sparrow.

Other name: NELSON'S SHARP-TAILED SPARROW.

Plate 69.

Description. — *Adults (sexes alike)*: Similar to Sharp-tailed Sparrow; bill shorter; colors brighter, pale streaks on back and scapulars more sharply contrasted against the rich brown or olivaceous ground color; chin and throat white; upper breast, sides and flanks deeper buff, more sharply in contrast with white lower breast and belly; upper breast, sides and flanks streaked much less distinctly, and with dusky or grayish instead of blackish. *Young:* Similar to young of Sharp-tailed Sparrow (see page 62).

Measurements. — Length 5.15 to 5.50 in.; spread 7.26 to 7.58; folded wing 2.10 to 2.33; tail 1.80 to 2.21; bill .44 to .53; tarsus .80 to .87. Female smaller than male.

Molts. — Same as in Sharp-tailed Sparrow (see page 62).

Field Marks. — Distinguishable from Sharp-tailed Sparrow only by an expert who has handled both birds and then only at close range or with excellent glasses; deeper, more clearly defined buff on breast and sides than Sharp-tailed Sparrow, and *much less distinctly streaked* there, where Sharp-tail has sharply defined blackish streaks.

Voice. — Like that of a grasshopper (W. Paine); call like that of Sharp-tailed Sparrow, short *chip* or *tweet;* song a short, weak, unmusical, twittering warble (N. S. Goss).

Breeding. — On low prairies. *Nest:* Sunk in ground, well arched over and closely hidden in thick clump of grass; deep and well built of fine grass, compactly woven. *Eggs:* Probably not always distinguishable from those of Sharp-tailed Sparrow, but should average smaller; a set from South Dakota is grayish-white, thickly marked with specks of light brown.

Range. — Fresh-water marshes of eastern United States and central and southeastern Canada, west to the Great Plains. Breeds in Canadian and Upper Transition zones from southern Mackenzie and west-central Alberta southeastward to southwestern Manitoba, northeastern South Dakota, Minnesota, Wisconsin and northern Illinois; winters coastwise through the Atlantic and Gulf States from North Carolina to Florida and Texas; migrates through the Mississippi Valley and the middle and northern states to New York, southern Ontario, and north on the Atlantic coast to Maine; accidental in California.

Distribution in New England. — *Maine:* Uncommon migrant. *New Hampshire and Rhode Island:* No records but probably rare fall migrant. *Vermont:* Rare fall migrant. *Massachusetts:* Uncommon fall migrant; casual in winter. *Connecticut:* Uncommon migrant.

Season in Massachusetts. — September 25 to October 15 (winter).

Haunts and Habits. Nelson's Sparrow, unlike the Sharp-tailed Sparrow, is a bird of the lower prairie region of the West, frequenting the neighborhood of fresh water, but during the fall migrations it flies southeastward to the Atlantic coast. While here, however, it seems to frequent mainly the neighborhood of beaches and salt-marshes. Its habits are much like those of the Sharp-tailed Sparrow. It is perhaps even more shy and secretive, rarely rising in flight more than a few feet above the grass, or flying more than a few yards when startled by the approach of an intruder. If the observer can keep quiet long enough, the bird's curiosity may overcome its timidity for the time being, and it may rise to some convenient perch where it may be observed at leisure.

Economic Status. Probably harmless but too rare to be of any importance in New England.

Passerherbulus nelsoni subvirgátus (Dwight). Acadian Sharp-tailed Sparrow.

Plate 69.

Description. — *Adults (sexes alike)*: Similar in general to both Sharp-tailed and Nelson's Sparrows, but more plainly colored than either; bill as small as that of latter, but other measurements equal to or exceeding those of former; back and scapulars without very conspicuous light streaks, the streaks sometimes obsolete; sides of head paler buff around the gray patch, and flanks also paler buff, streaked olive-grayish. *Young:* Similar to young of Sharp-tailed Sparrow (see page 62).

Measurements. — Length 6.00 to 6.50 in.; spread about 7.50 to 8.25; folded wing 2.14 to 2.32; tail 1.90 to 2.20; bill .43 to .51; tarsus .83 to .87. Female smaller than male.

Molts. — Similar to those of Sharp-tailed Sparrow (see page 62).

Field Marks. — Size of Sharp-tailed Sparrow, but *paler or lighter and more uniform above*, giving a paler, grayer effect; buff on sides of head and on breast and flanks paler and more washed out.

Voice. — Similar to that of Sharp-tailed Sparrow; song, a low unattractive *s-e-e-t-s-k* (W. H. Moore).

Breeding. — About brackish or fresh marshes or on low islands in lakes or rivers. *Nest:* On ground in grass; built of and lined with grass. *Eggs:* 4 or 5; .71 to .80 by .58 to .60 in.; pale greenish-blue, marked with "cinnamon-brown, umber and blue-gray."

Range. — Salt-water marshes of Atlantic coast in Canada and the United States. Breeds coastwise, mainly in Canadian Zone from southeastern Quebec, the Magdalen Islands, New Brunswick, Cape Breton Island and Prince Edward Island to southern Maine; winters on Atlantic coast from South Carolina to Georgia and northern Florida.

Distribution in New England. — Common migrant coastwise in the five coastal states, accidental in the interior; no Vermont record.

Season in Massachusetts. — May 20 to June 12; September 2 to November 5.

Haunts and Habits. The Acadian Sharp-tailed Sparrow is almost identical in haunts and habits with the Sharp-tailed Sparrow, and feeds on similar food (largely aquatic insects and grass seeds). So far as I know the only real difference in respect to their haunts is that the former seems rather to prefer the brackish and fresh marshes and low islands in rivers and is somewhat more northern in its breeding range, while the latter clings more closely to the salt-marsh. Both races have a flight-song in spring, both frequent the salt-marshes in migration, and one seems to be about as common as the other. The Acadian may seem less common usually in spring, but its greatest flight comes so late (near June 1) that it may be missed entirely by those who believe that the spring flight of land birds has passed or by those whose attention is directed toward the late shore-birds.

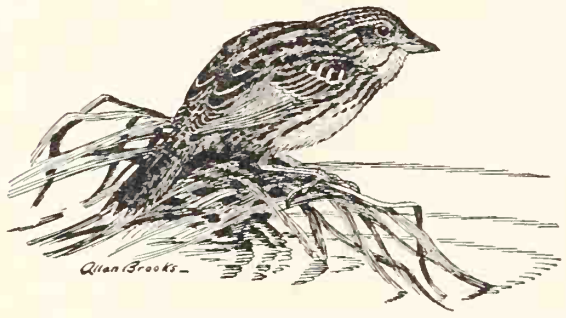
Economic Status. See page 64.

Passerherbulus marítimus maritimus (Wilson). Seaside Sparrow.

Plate 69.

Description. — Similar in form to the three foregoing members of this genus, but tail-feathers not quite so deeply pointed, larger, darker and with a larger, longer bill. *Adults (sexes alike)*: Above olive-gray, rather obscurely streaked on base and top of head with both darker and lighter, light grayish stripes on the dark olive-gray back most prominent; wings and tail dusky; wing-coverts and inner secondaries

more or less margined brown, the colors disposed on tertials as in other members of the genus, and lighter tips of greater coverts forming an inconspicuous whitish wing-bar; edge of wing at bend bright lemon-yellow; a triangular yellow patch or streak before eye, extending narrowly back above it from base of upper mandible, often fading to whitish near bill; sides of head, including eye and ear region, mostly olive-grayish; stripe down side of lower jaw, chin, throat and abdomen white or whitish; stripe on each side of chin and throat, and rather ill-defined streaks on upper breast, sides and flanks, grayish; bill light slate-color; iris dark brown; legs and feet pale brown. *Young in first winter plumage:* As adults, and indistinguishable from them. *Young in juvenal plumage:* Different from adults, more brown than gray above; back broadly and cap narrowly streaked blackish; below whitish, upper breast, sides and flanks buffy, streaked dusky.



Seaside Sparrow, Juvenile.

Measurements. — Length 5.25 to 6.50 in.; spread 8.15 to 8.50; folded wing 2.25 to 2.60; tail 2.00 to 2.50; bill .52 to .67; tarsus .83 to .97. Weight, male .90 oz. (B. H. Warren). Female smaller than male.

Molts. — Juvenal plumage acquired by complete molt of natal down, completed soon after young leave nest; first winter plumage by complete postjuvenal molt (late August, September); first breeding plumage by wear; adult winter plumage by complete post-nuptial molt (August, September); adults apparently have but one molt each year (postnuptial, complete) beginning in August.

Field Marks. — Somewhat larger and much darker and grayer above than Sharp-tailed Sparrow, especially about head and neck; light streaks on back not so conspicuous, with a *yellow patch before eye*, extending narrowly just above it, and a white streak on lower jaw bounded above and below by dark streaks. Young much browner, with dark streaks above.

Voice. — "Call note a squeaky *cheep*" (E. H. Eaton); song may be divided into two parts, first a "gurgling trill," second an insect-like high-pitched trill, as if the bird were breathing out and drawing in its breath (C. W. Townsend); song sometimes like that of Sharp-tailed Sparrow, but there is a difference in general between them, "the Seaside song is louder with a strongly accented note near the beginning, *tup tup tup tse trrrrrrr*" (A. A. Saunders).

Breeding. — In salt-marshes. *Nest:* In areas of fine marsh grass, often under patches of dead drift-grass or bushes above usual high water-mark, or in salt-marsh grass over water; said sometimes to be built in a bush; built of dried grasses lined with finer blades. *Eggs:* 4 to 6; .75 to .88 by .56 to .68 in.; oval to nearly elliptical; grayish-white, commonly coarsely spotted with reddish-brown, more heavily marked than those of Sharp-tailed Sparrow; figured by E. A. Capen in "Oölogy of New England," Plate IX, Figs. 5, 6. *Dates:* May 20 to June 7, Virginia; June 8 to July 17, southern New England. *Incubation:* Chiefly if not wholly by female. One brood yearly.

Range. — Salt-marshes (mainly) on Atlantic coast of United States. Breeds chiefly in Upper Austral Zone from eastern Massachusetts to southeastern Virginia; winters coastwise regularly from Virginia to Florida, casually north to southeastern Massachusetts.

Distribution in New England. — *Maine (probably also New Hampshire)*: Accidental visitor coastwise. *Vermont:* No records. *Massachusetts:* Not uncommon local summer resident on southeastern coast, where recorded in winter; rare or casual summer visitor north to near New Hampshire line in Essex County. *Rhode Island:* Uncommon local summer resident. *Connecticut:* Common summer and possibly rare winter resident locally coastwise.

Season in Massachusetts. — April 10 to September 21 (winter).

Haunts and Habits. The Seaside Sparrow is well named. No land bird lives closer to the sea. It nests mostly on the ground and, like a sea-bird, just above the reach of ordinary tides. So close is its little domicile to the summer tide marks that, like those of terns and gulls, it is flooded sometimes by storm tides. The salt-marsh is its principal habitat and it frequents the inner shores of sea islands lying near the coast. Its habits are similar to those of the Sharp-tailed Sparrow, but it is most common near the water's edge, where when undisturbed it often wades like a rail or a sandpiper, and where it gets much of its food.

It stays for the most part on the ground or near it, and like the other marsh sparrows runs through the concealing grass like a mouse. Often, however, the song is given from the top of some low bush, and the male indulges in a song flight, in which it emulates the Skylark, rising into the air, fluttering upward, singing the while, and finally sailing down to its perch again. Its upper plumage is so dark as to render it inconspicuous when seen against a background of dark mud. It does not seem quite so shy, however, as other marsh sparrows, and its curiosity will usually bring it to view when an observer imitates the cries of a bird in distress. Nests have been found in the grass, in or under seaweed thrown up by the tide, or even somewhat raised from the ground in bushes.

In the breeding season this bird has been rather common locally for years on the coast at Westport, Massachusetts, where Mr. John A. Farley in 1896 discovered the first nest of the species recorded within the Commonwealth. It visits Marthas Vineyard and possibly breeds there and locally along the south shore of Cape Cod, but I have no authentic breeding records, and have only one record of its presence on Nantucket. According to Audubon, a few pairs once bred near Boston, and a nest has been reported from Saugus, but the report has not been verified. In migration or in aimless wandering, some birds of this species have been reported all along the Massachusetts coast, as far at least as Ipswich, which is not a great distance from the New Hampshire line. In autumn birds of this species sometimes join loose flocks of the Sharp-tailed Sparrow, and as the two species frequent a similar habitat and as one occasionally has been mistaken for the other, reports are not always reliable.

According to Dr. S. D. Judd the food of the Seaside Sparrow is similar to that of the Sharp-tailed Sparrow, but the former eats fewer sand-fleas than the latter, and many small crabs, — these the latter is not known to take.[1]

Economic Status. As this bird feeds largely on insects as well as on marine invertebrates, it may be of some economic importance, by destroying insect enemies of marsh grass.

Chondéstes grámmacus grammacus (Say). Lark Sparrow.

Other names: QUAIL-HEAD; ROAD-BIRD.

Plate 69.

Description. — Bill rather large, convex-conic; wings long, pointed, longer than long rounded tail; lateral toes short, tips of their claws not reaching base of middle claw. *Adults in breeding plumage (sexes*

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 65, 66.

alike): Ground color grayish-brown above, streaked black, rump unstreaked; white below becoming buffy-grayish-brown on sides and flanks; head black, white and chestnut; top of head chestnut (blackening on forehead) divided and bounded by white stripes; rest of head, chin and throat white with a chestnut ear-patch, a black line running from near bill through eye, around ear-patch and back under it to near gape, and another slightly broken from base of lower mandible down side of chin and throat, widening somewhat as it goes; a black spot sharply contrasted against middle of upper breast; wings mainly dusky with light grayish-brown feather-edges and tips; middle pair of tail-feathers light grayish-brown, rest dark brown to black with paler edges and white tips, the white running well up the exposed part of outer web of outer feather; bill dusky above, bluish-white below; iris brown; legs flesh-color, darkening on feet. *Young in first winter plumage:* Practically indistinguishable from adults. *Young in juvenal plumage:* Top of head and ear-patch grayish-brown, former streaked with blackish; black markings of head not so firm and prominent as in adults; whole plumage suffused usually with buffy, and breast streaked with dusky; "bill and feet pinkish-buff, the upper mandible becoming dusky, the lower and the feet dull clay-color" (J. Dwight).

Measurements. — Length 5.75 to 6.75 in.; spread 10.50 to 11.10; folded wing 3.18 to 3.60; tail 2.60 to 3.00; bill .40 to .52; tarsus .72 to .82. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt, beginning as usual in the nest; first winter plumage by complete postjuvenal molt (July, August); according to Dr. Jonathan Dwight first breeding plumage comes by partial prenuptial molt in March, involving forward parts of head, also chin and throat, and by wear of rest of plumage; adults, he assumes, have two molts, a complete postnuptial (July in Kansas) and a prenuptial molt in spring like that of the young bird.

Field Marks. — Song Sparrow size; readily identified by chestnut ear-patch, black and white markings of head, plain unstreaked breast with one central black spot, and blackish, fan-shaped, white-tipped tail with much white on the outer feathers.

Voice. — Song somewhat like that of Indigo Bunting, but louder, clearer and much finer; "composed of a series of chants, each syllable rich, loud, and clear, interspersed with emotional trills. . . . Though seemingly hurried, it is one continued gush of sprightly music; now gay, now melodious, and then tender beyond description — the very expression of emotion" (Robert Ridgway).

Breeding. — On prairies or other open lands, in the neighborhood of bushes and trees; in grass fields, pastures and broken grassy grounds and even in gardens. *Nest:* On ground or in low tree or bush; built mostly of grasses, lined with rootlets, fine grass and long hairs; sometimes repairs and uses abandoned nests of other birds. *Eggs:* 3 to 5; .80 to .85 by .60 to .65 in. (these measurements not extremes, size very variable); rounded oval; white, pinkish-white or grayish-white, spotted and streaked, blotched or scrawled with dark brown or black, and often also with purplish; figured by A. R. Dugmore in "Bird Homes," Plate B, Fig. 3. *Dates:* May 17, southern Minnesota. *Incubation:* Period about 12 days, chiefly by female.

Range. — Mississippi Valley (chiefly), eastern United States and west to edge of the Great Plains. Breeds in Transition and Austral zones from southern Manitoba, northeastern North Dakota, central Minnesota, central Wisconsin, central Michigan and southeastern Ontario, south to southeastern Oklahoma, southern Louisiana and central Alabama, east to western New York, western Pennsylvania, western Maryland, West Virginia and central North Carolina and west to eastern Nebraska and eastern Kansas; winters in southern Mississippi and Florida; casual, at least in migration, in eastern Texas, Nova Scotia, Massachusetts, southeastern New York, New Jersey and District of Columbia; accidental in Cuba.

Distribution in New England. — Rare visitor. *Maine:* Monhegan Island, August 25, 1913, and August 16 to 29, 1917, "two or three" seen by Rev. Robert F. Cheney;[1] September 9 and 10, 1918, bird seen by Dr. John W. Dewis and Judge Charles F. Jenney;[2] Matinicus Island, August 12, 1925, bird seen

[1] Cheney, Rev. Robert F.: *in litt.*

[2] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. XI, 1919, pp. 35 and 40.

by Dr. C. W. Townsend and Francis H. Allen.[1] *Massachusetts:* Howe and Allen, in their "Birds of Massachusetts," give four records prior to 1900. Ipswich, August 21, 1904, adult male taken by Dr. C. W. Townsend;[2] August 12, 1905, one seen by Dr. C. W. Townsend;[3] August 28, 1908, bird seen by Mrs. Lidian E. Bridge and Miss E. D. Boardman;[4] Manchester, August 23 and again on September 27, 1910, bird seen by Miss E. D. Boardman;[5] September 15, 1911, bird seen by Miss E. D. Boardman;[6] Berlin, September 25, 1910, bird observed by Miss J. E. Kloseman;[7] Rockport, August 16, 1918, two seen by Miss Evelyn A. Monroe;[8] Edgartown, October 10, 1918, to February 9, 1919, bird observed at intervals by Mrs. Mona W. Worden, and on last date by Francis A. Foster.[9] *Connecticut:* Long Ridge, June 10, 1912, bird seen "in full breeding plumage" and nest with four eggs found by P. G. Howes.[10]

NOTE. As the above records for Maine and Connecticut are "sight" records and no specimens have been taken in those states, the species must be retained on the "hypothetical" lists, but the bird is unmistakable when viewed under favorable conditions.

SEASON IN MASSACHUSETTS. — April 6 to 29; August 12 to November 25 (winter).

HISTORY. Dr. J. M. Wheaton says in his "Report on the Birds of Ohio" (1879) that the Lark Sparrow was first known as an Ohio bird in 1861, and that "it has since appeared quite regularly and in increasing numbers," and Dr. A. W. Butler tells us in "The Birds of Indiana" (1897) that it made its first appearance in Ontario in 1861. He says that it is a prairie species that is gradually extending its way into the former forest area, and gives some records which indicate this. Professor E. H. Eaton, in his "Birds of New York" (1914), says that it is evidently extending its range gradually from the Mississippi Valley and that it already has appeared in northern and eastern Ohio and western Pennsylvania, and he refers to the first known nesting of the species in New York in 1911. Possibly in time it may continue to extend its breeding range into New England, as the Prairie Horned Lark has done. It seems to be less rare as a visitor to Massachusetts now than it was years ago.

HAUNTS AND HABITS. The Lark Sparrow is a handsome, well-marked, unmistakable bird, and one of the finest singers of the sparrow tribe. It frequents prairies, old fields, pastures, grass fields, open woods and even cultivated lands. It is not so terrestrial as some of the other ground-sparrows, as it alights in trees, frequenting them much after the breeding season, and in some cases nests in bushes or low trees. In spring it frequents roadsides. Hence the name "Road-bird," which is applied to it in the West. Another vernacular name is "Quail-head" from the striped appearance of its head.

During the mating season the males have frequent contests, often carrying their battles into the air. Mating and nesting are carried on mostly in the open, but after the young have been reared, all are likely to retire to the borders of open woodlands, or to bushy, partly wooded pastures until the molting season has passed, when in August the southward movement begins.

[1] Auk, Vol. XLIII, 1926, p. 246.
[2] Birds of Essex County, Massachusetts, 1905, p. 268.
[3] Auk, Vol. XXIII, 1906, pp. 103, 104.
[4] Auk, Vol. XXV, 1908, p. 476.
[5] Supplement, Birds of Essex County, Massachusetts, 1920, p. 145.
[6] *Ibid.*, p. 146.
[7] Auk, Vol. XXVIII, 1911, p. 114.
[8] Monroe, Miss Evelyn A.: *in litt.*
[9] Worden, Mrs. Mona W.: *in litt.*; Foster, Francis A.: *in litt.*
[10] Howes, P. G.: Oölogist, Vol. XXIX, September 15, 1912, pp. 348, 350.

The Lark Sparrow is a great consumer of grasshoppers and locusts, and of weed seeds; about half its vegetal food consists of the seeds of grass and grain.

Economic Status. Dr. S. D. Judd, after analyzing the stomach contents of 167 birds of this species, says that from this investigation it appears that the bird "merits a high place among the useful tenants of the farm." [1]

Zonotrichia leucophrys leucophrys (J. R. Forster). White-crowned Sparrow.

Plate 70.

Description. — A large sparrow with rounded wings and rather long, very slightly forked, tail; tertials not as long relatively as in *Passerherbulus;* bill nearly conic, but slightly convex above and below; legs and feet strong; lateral toes about equal in length. *Adults (sexes alike or very similar)*: Upper head chiefly white above and behind eye, striped with black as follows — the white is bounded behind eye by two narrow black stripes, one on each side, and traversed on each side of white crown by two wide black stripes which, united on forehead, divide and run backward above eyes to back of head, thus dividing the white into three broad stripes, the middle (crown) stripe widest, sometimes ashy; general body color gray, lightening posteriorly below; back and scapulars light gray or more brownish, broadly streaked with brown; rump and upper tail-coverts plain lighter brown; flight-feathers and tail-feathers chiefly dark hair-brown; tertials dusky, margined whitish terminally, passing into chestnut basally; primaries with pale edges; lesser wing-coverts brown; middle and greater wing-coverts dusky, margined brown, passing into chestnut-brown on inner coverts, and tipped white, forming two white wing-bars; edge of wing white; below, the gray lightens to almost whitish on chin, throat and abdomen, and passes into pale buffy-brown on sides, flanks and axillars, and into buffy on under tail-coverts, which have concealed dusky centers; wing linings grayish; bill bright reddish-brown, tip dusky; iris brown; legs and feet light to pale reddish-brown, toes sometimes darker. *Young in first winter plumage:* Similar to adults, but more brown above; light stripes of back buffy instead of gray, much pale grayish about back and sides of neck, light markings of head buffy or brownish, dark ones and ear region brown; bill at first pinkish-buff, turning later to reddish-brown; legs and feet flesh-color, turning to brown. *Young in juvenal plumage:* Sometimes like young in first winter, but streaks on back and scapulars blackish instead of brown; forehead and upper lores brownish, darker stripes on head dark brown to lighter brown, streaked dusky, lighter stripes light grayish-brown; below dull buffy-whitish or grayish-white, streaked largely with dusky or blackish on throat, upper breast, sides and flanks.

Measurements. — Length 6.50 to 7.50 in.; spread 9.20 to 10.30; folded wing 2.90 to 3.30; tail 2.80 to 3.20; bill .43 to .50; tarsus .88 to .98. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt, involving body plumage and wing-coverts, completed (early September) before the bird leaves its breeding range; first breeding plumage (which is virtually as adult) by partial prenuptial molt (December to April), chiefly on head; probably another year is often required to produce highest plumage; adults have complete postnuptial molt (beginning in August) and may have some molt about head in spring, as in young.

Field Marks. — Size, larger than Song Sparrow. *Adults:* Quite gray on fore parts and below, with browner back, rump, wings and tail and two white wing-bars; head marked conspicuously above with three broad white crown stripes bordered by broad black stripes; no yellow on head, white stripe on crown broadest, and black instead of yellow before eye; no clearly defined white throat-patch. *Young:* Similarly marked, but more brown and buffy, and head markings reddish-brown and light grayish-brown in place of black and white.

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, p. 68.

PLATE 70

PLATE 70

WHITE-CROWNED SPARROW

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ADULT IN SPRING

WHITE-THROATED SPARROW

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ADULT IN SPRING

IMMATURE

IMMATURE

Louis Agassiz Fuertes

Voice. — Alarm note a sharp *chip;* call-note *chink* or *tsip;* song a sweet but rather short lay of five to seven notes, first long and clear, and all clear except two next the last which are somewhat blurred, sometimes repeated twice with no appreciable interval between the two renderings; has something of quality of Vesper Sparrow's tones, and diminishes toward the end like that of White-throated Sparrow; a sad song, *more wet wetter wet chee zee* (C. W. Townsend); a "soft varied whistle of gentle melancholy" (W. L. Dawson).

Breeding. — In woods or thickets in well-watered lands. *Nest:* On ground, often among moss, at foot of low tree or shrub, rarely low in bush; built of grass, moss, rootlets, etc., and lined with fine rootlets, hair or fur. *Eggs:* Usually 4 or 5; .78 to .95 by .60 to .65 in.; oblong to oval; bluish-white to greenish-white, spotted thickly with reddish-brown and purplish-brown, and sometimes with a little black. *Dates:* June 23 to July 6, Labrador. *Incubation:* Wholly or chiefly by female. One brood yearly. (See Fig. 70.)

Range. — North America. Breeds in Hudsonian and Canadian zones from tree limit in eastern Mackenzie, northern Manitoba, northern Ungava (Quebec) and southwestern Greenland south in mountains through Alberta and southeastern British Columbia to southern Oregon, central-eastern California, central Nevada, central Utah and northern New Mexico and to southwestern Saskatchewan, central Manitoba, northern Ontario, southern Quebec (Gulf of St. Lawrence) and Newfoundland; winters from northern Lower California, southern Arizona, southern Kansas, central Missouri, southern Illinois, southern Indiana and southern Pennsylvania south to central Mexico (Valley of Mexico), Louisiana, Alabama and Florida; casual or accidental in Cuba.

Distribution in New England. — *Maine:* Uncommon migrant, sometimes more common; casual in summer. *New Hampshire:* Uncommon migrant. *Vermont:* Rather common migrant; casual summer resident on highlands. *Massachusetts, Rhode Island and Connecticut:* Uncommon migrant, irregularly more common.

Season in Massachusetts. —(April 19, 26) May 4 to June 9 (July 8 to August 18); September 22 to November 6 (winter). Winter records: Williamstown, January, February, 1923, immature bird seen by Laurence H. Taylor and William J. Cartwright; Lakeville, February 26, 1923, one seen by Mrs. A. G. Mathers; Lancaster, January 16, 1923, adult taken by Herbert Parker; Knightville (Huntington), January 25 to February 1, 1928, immature came regularly to the feeding station of Clarence E. Bates, reported by Albert A. Cross.*

Haunts and Habits. It is a red-letter day for the novice in New England ornithology when he first meets this bird of distinguished appearance. Its gray vesture, black and white crown and elegant form give it an aristocratic appearance as if it were above the common herd of sparrows and in a class by itself. It arrives in Massachusetts usually during the latter half of May. In some seasons few are seen, but in others it is locally common for a short time. It seems more numerous in spring than in autumn, when it usually appears in October. In spring it frequents cultivated fields, pastures, roadsides and thickets bordering fields. In autumn it may be found with other sparrows in weedy cornfields or potato fields, along the roadsides and wherever the seeds of weeds are abundant. I have seen this species in small flocks in spring, but when it comes in such numbers it usually passes north quickly. In most years one or a few are seen here and there from time to time for two or three weeks.

It prefers to feed near some thicket or brush heap, to which it can fly for safe refuge, if attacked by its enemies. In warm autumn days, like many other birds, it may vocalize softly in a "whisper song" that can be heard only for a short distance.

* Mr. J. R. Mutch, of Mount Herbert, Prince Edward Island, informs me that on March 5, 1920, he saw and fully identified two White-crowned Sparrows there which, he thinks, must have wintered.

The White-crowned Sparrow feeds largely on insects during spring and summer, taking ants, caterpillars, weevils, other beetles, grasshoppers and locusts and also spiders. It takes a little grain, mostly waste grain, many weed seeds, a little wild fruit, some grapes and some buds and blossoms of trees. The greater part of its food is vegetal, but no thorough all-the-year-round examination of the food of the eastern race has been made.

Economic Status. The White-crowned Sparrow is of little economic importance in New England, because of its small numbers and short stay in this region. While here, however, it is apparently more beneficial than harmful.

Zonotrichia albicóllis (Gmelin). White-throated Sparrow.

Other name: PEABODY BIRD.

Plate 70.

Description. — Similar in size and shape to White-crowned Sparrow, but differently marked about head. *Adult male:* Top of head black, divided by a central white line (narrower than the white stripe of White-crowned Sparrow) and bordered on either side by a rather broad line over eye, which is yellow before and above eye and white behind it, where it is bordered below by a blackish stripe, this line extending to nape; a blackish or black line from gape down each lower jaw borders a pure white, conspicuous upper throat, which is abruptly defined against gray of lower throat (some have two more black lines, one at lower edge of each side of lower mandible, dividing white throat into three parts, and in very high plumage white is outlined narrowly by black at its lower border); sides of head (except as above), neck, lower throat and upper breast gray or ashy, passing into ashy-brownish on sides and flanks; lower breast, abdomen and under tail-coverts white or whitish; back and scapulars striped rusty or chestnut-brown and blackish; rump and upper tail-coverts light brown; wings and tail dark brown or dusky, the feathers edged with lighter brown; middle and greater wing-coverts tipped white, forming two narrow white wing-bars; edges of wing about bend yellow; wing linings silvery white; bill dark brown or dusky above, below paler and bluish or bluish-gray, especially toward base; iris brown; legs and feet pale brown or reddish-brown, toes darkest. *Adult female:* Much like male, but usually duller in colors of head and under plumage, the black crown-stripes tinged or streaked with brown, white stripes grayer, yellow duller and white throat-patch smaller. *Young in first breeding plumage:* Some immature birds may become as adults in this plumage, but many remain much as in first winter, while others show some brown feathers in black stripes of head, and other signs of immaturity. *Young in first winter plumage:* Some are supposed to be as adults (which I doubt), most have white and black markings of head and throat more or less obscured or replaced by brown; all are believed to have some yellow anteriorly in the light stripe over eye; females usually have crown stripes paler brown than males; some have a heavy black or blackish streak on each side of upper throat and chin; others have two black lines on each side, dividing chin and throat into three parts; these marks sometimes persist in the adult. *Young in juvenal plumage:* Above chestnut-brown, darkest on head, streaked with blackish; the light stripes on head olive-gray tinted buff; feathers of back edged buff; wings and tail deep olive-brown, all feathers edged and tipped lighter brown; below dull white, tinged buffy on breast and sides, and thickly streaked with clove-brown; edge of wing about bend yellow in all stages except in some fledglings where white.

Measurements. — Length 6.30 to 7.45 in.; spread 8.80 to 10.00; folded wing 2.80 to 3.15; tail 2.60 to 3.35; bill .42 to .50; tarsus .81 to .95. Weight 1.25 oz. (Willis H. Ropes). Female smaller than male.

Photograph by Dr. Arthur A. Allen

FIG. 70. — WHITE-CROWNED SPARROW, NEST AND EGGS

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Photograph by Miss Cordelia J. Stanwood

FIG. 71. — YOUNG WHITE-THROATED SPARROWS IN NEST

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Molts. — Juvenal plumage acquired by complete molt of natal down; first winter plumage by partial postjuvenal molt (August) of body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (October to April), usually mostly confined to head, throat and breast; * adult winter plumage by complete postnuptial molt (August); adult breeding plumage by partial prenuptial molt, usually involving head, throat and breast; adults have complete postnuptial molt (August) and probably an incomplete prenuptial molt in spring.

Field Marks. — Size larger than Song Sparrow. *Adults:* Differ from White-crowned Sparrow in head markings, white crown-stripe narrower, light line above eye *yellow* from bill to eye, and throat conspicuously and abruptly white. *Young:* Similar, but browner, the light and dark markings on head evident, but brown instead of black and white; throat-patch evident, but not pure white; yellow before eye duller.

Voice. — Alarm note a brisk metallic *chip;* another note *sst*, similar to a lisping note of Song Sparrow and Fox Sparrow (R. Hoffmann); a curious clinking call-note when the birds are retiring to their roosts (S. D. Judd); song a series of fine, clear, pensive whistles, diminishing slightly toward the end, often translated as *Old Sam Peabody, Peabody, Peabody,* or *Sow Wheat Peverly, Peverly, Peverly;* a longer song as given on the breeding grounds, *pea-pea-pea-all-day-long-sow-your-pea-sow-your-pea-sow-your-pea* (O. W. Knight).

Breeding. — In bushy thickets, "brush pastures," open bushy woods, forest glades or the "slash" left where woods have been cut off, and mainly in hilly country. *Nest:* Like that of Song Sparrow, but larger; on ground under bush, on some hummock or under a pile of brush in woods or clearings, rarely a foot or two from the ground in dense coniferous tree; composed of grass, rootlets and leaves (sometimes moss and bark strips are used) and lined with fine grass or hair, or both. *Eggs:* Usually 4 or 5; .75 to .92 by .59 to .65 in.; ovate to rounded ovate; very variable, bluish or grayish-white to pale greenish-blue, dotted or heavily spotted with reddish-brown, and often with darker brown, chiefly toward large end, some have markings of lilac and spots or lines of blackish; figured by E. A. Capen in "Oölogy of New England," Plate X, Figs. 5, 6. *Dates:* May 28, New York; May 20 to July 14, Maine. *Incubation:* Period 12 to 14 days (O. W. Knight); by female. Two broods yearly.

Range. — North America, mainly east of the Rocky Mountains. Breeds chiefly in lower Hudsonian and Canadian zones from northwestern Mackenzie, northern Manitoba, northern Ontario, southern Ungava (Quebec) and southern Labrador south to central British Columbia, central Alberta, south-central Saskatchewan, northern North Dakota, central Minnesota, central Wisconsin, central Michigan, southeastern Ontario, mountains of Pennsylvania and Connecticut; casual in summer in Montana, Iowa, Indiana and District of Columbia; winters from central California (casually), Kansas, Missouri, southern Illinois, southern Ohio, southern New York, Massachusetts and Maine (casually), to southern California (casually), Tamaulipas (northeastern Mexico), southern Louisiana, southern Alabama and southern Florida; casual in Oregon, Idaho, Colorado and Wyoming.

Distribution in New England. — *Maine:* Common migrant; common summer resident except in extreme southwest; casual in winter in southern parts. *New Hampshire:* Common migrant; common summer resident up to about 5,000 feet, becoming less common and local in southern part. *Vermont:* Common migrant; very common summer resident on hills above 1,200 to 1,500 feet, but not on very highest elevations. *Massachusetts:* Common migrant, breeding locally on western and northern highlands and sporadically elsewhere; rare winter resident, chiefly coastwise. *Rhode Island:* Common migrant; rare winter resident. *Connecticut:* Common migrant, and uncommon local winter resident, chiefly coastwise; breeds casually in western highlands.

Season in Massachusetts. — April 11 to June 1 (summer), September 1 to November 24 (winter).

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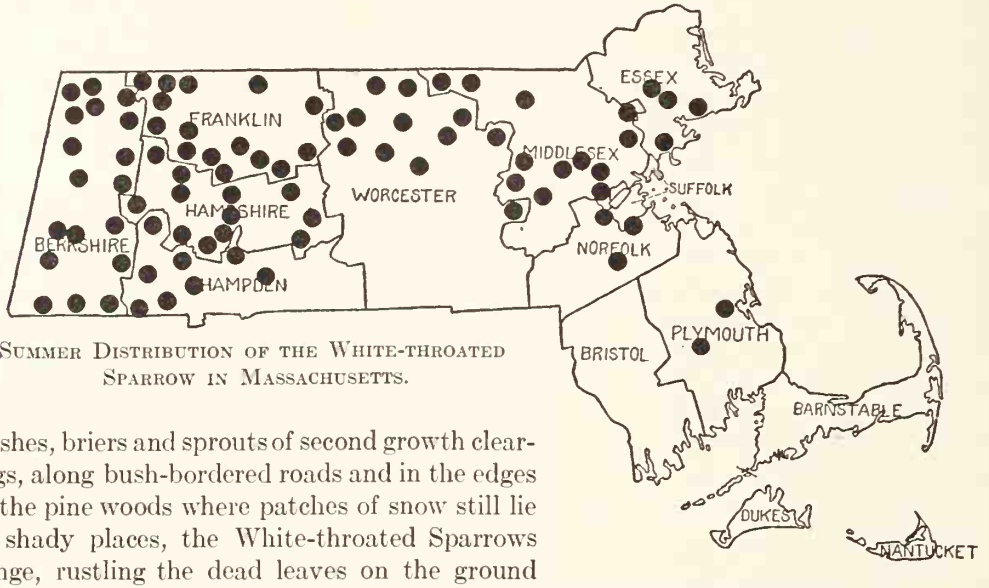
* Mr. M. J. Magee sends me a record of a banded bird (that he believes was hatched in 1925) that had not attained full adult plumage on May 5, 1927. Some require an extra year, or possibly even more, to assume highest plumage. I have seen skins of males taken in May, June and July that were not in full adult plumage.

HAUNTS AND HABITS. It is April. At last winter has gone, after many days of snow and others of northerly and easterly gales, and the sun rises on a perfect day. The morning opens with a chorus of Robin song, mingled a little later with the trill of the Chipping Sparrow, the jingle of the Song Sparrow, the clanging of Grackles and the love notes of Flickers. Soft southeasterly breezes stir last year's leaves; flies and gnats buzz about in the sunlight; a few great bees are mumbling about in the green grass on the lawn, and frogs are croaking hoarsely at the head of the pond, as if uneasily bestirring themselves and trying their voices after the long winter sleep. Among the brush heaps,



SUMMER DISTRIBUTION OF THE WHITE-THROATED SPARROW IN MASSACHUSETTS.

bushes, briers and sprouts of second growth clearings, along bush-bordered roads and in the edges of the pine woods where patches of snow still lie in shady places, the White-throated Sparrows range, rustling the dead leaves on the ground as they scratch with both feet. They are on their leisurely way from the sunny south to northern New England and Canada.

They prefer to stay on or near the ground, and although they alight in trees they seldom perch very high. When danger threatens they are likely to fly to some thicket or heap or brush for safety. In the spring migration they seem to prefer low thickets in moist places, but in their summer home they may be found almost anywhere in bushy pastures, thickets and woods, and in fall migration numbers visit weedy gardens and cornfields.

The White-throated Sparrow is one of the sweetest singers among the sparrow tribes. The brief song that it gives occasionally during the migration is not its best music, which for its full effect should be heard on its northern breeding grounds at evening, when, as Mr. C. J. Maynard says, "the ledges of the mountain tops are gleaming in the brilliant moonlight and the silvery beams are finding their way through the openings in the shadowy forest, illuminating the little glades which form the home of the Sparrows. . . .

Then, when all else is silent save the occasional melancholy notes of the Whip-poor-will or the distant hoot of some Owl, the effect produced by this incomparable song is surpassingly beautiful." Like the White-crowned Sparrow this bird sings more or less at night as well as throughout the day, but most commonly at morning and evening. Its night song has caused it to be named the *Rossignol* or Nightingale among the French-Canadian people of some of its northern breeding grounds. (The same name is said to have been applied to the Song Sparrow by early settlers in the Maritime Provinces.)

Normally this sparrow breeds in the glades of coniferous forests, preferring northern firs and spruces, but on the hills of western Massachusetts from which most of the spruce has been cut it often remains to breed in waste left by the lumberman.

When mated, a pair seem quite devoted. Mr. A. C. Reed tells of a female that stayed close by a wounded male, and when danger menaced she threw herself in the path of the enemy, simulating a badly injured bird, until she had led the intruder away, when she returned to her disabled mate.[1]

Nest building requires about a week, and apparently the female builds the nest and incubates the eggs without help from her partner. However, he assists her in feeding the young. If nothing untoward occurs the young leave the nest in about twelve to fourteen days. When the last brood has been reared, when the August molt is done, the families, which by this time have assembled in straggling flocks, begin to move southward, and most of them have left New England by the last of October. As they retire toward the south, a few of them (possibly young) make some rather lisping, ineffectual attempts at song, but the result will not compare with the nuptial song given on the breeding grounds. A number of them spend the winter irregularly along the coasts of southern New England, and a few occasionally winter in the interior. Mrs. Mary E. Hubbard of New Haven, Connecticut, banded a White-throated Sparrow there in December, 1925, that came to the station again in December and January, and to a near-by station in April, 1926, but the same bird was taken in North Carolina on March 5, 1927, indicating that while it probably spent the winter of 1925–26 in Connecticut, it may have passed the next winter in the South. The few that remain in winter along our coasts are hardy birds, for when the waters are frozen they eat snow and take snow baths.

The White-throated Sparrow feeds largely on the ground, where it advances mostly by hopping, and it secures its food chiefly by scratching with its claws, digging with its bill, or by hopping up at food just out of reach. It destroys many insect pests, such as destructive beetles, grasshoppers and locusts, and eats the seeds of many troublesome weeds. It takes very little grain, mostly waste, and many wild berries. It seems fond of red alder berries and those of poison ivy and smilax.

Economic Status. Dr. Sylvester D. Judd, who gives in Bulletin No. 15 of the Biological Survey the results obtained from examining 217 stomachs of the species, regards it as a valuable bird on the farm.

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[1] Oölogist, Vol. XXV, March, 1908, p. 44.

Spizélla monticola monticola (Gmelin). Tree Sparrow.

Other names: WINTER CHIPPY; CANADA SPARROW.

Plate 71.

Description. — Bill small and conic; wing rather pointed, about length of broad-feathered and very slightly forked tail (tail-feathers widening a little at tips). *Adults (sexes alike)*: Top of head, streak behind eye, more or less of ear region, and often a streak down side of jaw, chestnut; rest of sides of head and neck chiefly gray (sometimes more or less whitish or very light brown, especially a stripe from bill over and behind eye; a dusky spot in center of upper breast just below gray of throat, this spot very rarely double and still more rarely wanting; a rusty-brown patch on each side of upper breast near bend of wing; elsewhere below dull white, shading into pale brown or brownish-buffy on sides and flanks; back and scapulars streaked pale grayish-buffy, black and rusty-brown; rump and upper tail-coverts brown; middle and greater wing-coverts black with chestnut edges and tipped white, forming two white wing-bars; tertials similar, other flight-feathers dusky; tail dusky, feather-edges grayish-white, outer web of outer tail-feather whitish; in winter rusty top of head more or less veiled by grayish feather-tips; upper mandible and tip of lower dark brown or blackish, rest yellow, orange-yellow or orange; iris brown; legs brown, feet darker, legs brownish-clay-color; "feet black" (Wilson). *Young in first winter plumage:* As adults, but top of head sometimes more veiled with gray. *Young in juvenal plumage:* Top of head dull brown, streaked dusky, no light middle line on crown; rump paler and grayer than in adults, and slightly streaked or mottled dusky; below whitish, tinged buffy across upper breast and on sides; sides of throat, breast and sides of body streaked dusky; otherwise about as adult.*

Measurements. — Length 5.80 to 6.50 in.; spread 8.60 to 9.75; folded wing 2.80 to 3.10; tail 2.57 to 2.90; bill .35 to .45; tarsus .78 to .85. Weight .75 to 1.00 oz. (Willis H. Ropes). Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August), apparently involving only body plumage; first breeding plumage by wear alone; adults have complete postnuptial molt and acquire breeding plumage mainly by wear, but the gray feather-tips on crown and other parts of the plumage begin to disappear rapidly about the middle of February; some seem to be molting about base of bill and chin at this time.

Field Marks. — About Song Sparrow size, and distinguished from that and other sparrows by color of bill — *dark above, yellow below* — and *large dusky spot* in the middle of plain grayish breast; two white wing-bars; no other sparrow in New England has this combination.

Voice. — Alarm note a slight *tsip;* flock has a cheerful musical twitter, each bird uttering *teel-wet;* a sweet song beginning with four long-drawn notes, *whee-hee-ho-hee* (R. Hoffmann), or *seet-seet, seetiter-sweet-sweet,* last two notes lower than first two (Townsend and Allen).

Breeding. — Usually in thickets, near water. *Nest:* On ground or low in bush, usually under bushes or low branches; bulky and warm, built of grasses and rootlets or weeds and bark strips, lined with hair or fur; mud is said to be used sometimes in its construction. *Eggs:* 4 or 5; .70 to .80 by .55 to .60 in.; ovate; light green or greenish-ash, flecked or dotted with regularly distributed marks of light brown. *Date:* June 10, Fort Chimo, Labrador. *Incubation:* No data.

Range. — North America, mainly east of the Great Plains. Breeds mostly in Hudsonian Zone from central-northern Mackenzie, northern Keewatin, northern Ontario and northern Ungava (Quebec) south to northern-Saskatchewan, north-central Manitoba, southern Ontario, southern Quebec, New Brunswick, Nova Scotia (casually) and Newfoundland; winters from Minnesota, Wisconsin, Michigan, southern Ontario, southern Quebec, New Brunswick, Prince Edward Island and Nova Scotia to eastern Oklahoma, central Arkansas, Tennessee and North Carolina.

* Mr. C. L. Whittle informs me that each winter one or more Tree Sparrows, having a little gray feather "horn" above each eye, come to his banding station. He believes these to be birds over two years of age.

PLATE 71

PLATE 71

FIELD SPARROW
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CHIPPING SPARROW
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TREE SPARROW
Page 76

SLATE-COLORED JUNCO
Page 85

FEMALE

MALE

Allan Brooks

Distribution in New England. — *Maine:* Common migrant; winter resident in southern parts. *New Hampshire:* Common migrant; rather uncommon winter resident from White Mountains south.* *Vermont:* Common migrant; less common winter resident, principally on lower lands. *Massachusetts, Rhode Island and Connecticut:* Common migrant; less common winter resident.

Season in Massachusetts. — (September 9, 21) October 7 to April 28 (May 7, 16, 28).

Haunts and Habits. When the frosts of autumn chill the northland the Tree Sparrows come. We look upon their arrival as an augury of impending winter. Many of them pass on, but when the snow lies deep over hill and dale we find some still with us, sitting in flocks in sunny sheltered thickets or feeding far out in weedy fields, leaving multitudinous tracks on the snow. They linger in birches along roadsides, and feed about farmsteads, preferring open country to woodlands and seeking the companionship of man for the food material he scatters and wastes. They come with Juncos to feed in open poultry sheds or about barnyards and they come readily to farmhouse doors for crumbs, seeds and chaff thrown out for the birds by kindly people. When deep snow covers most of their food, they scatter more or less, and single birds appear here and there scouting about. When they find a good food supply others soon appear. In feeding on weed seeds they take them from the ground, or pick them from the weeds, while standing on the ground or snow, but they also alight on the plants and pick off the seeds, somewhat after the manner of the smaller sparrows, Goldfinches and Pine Siskins. The winter habits of the Tree Sparrow are as an open book to all rural residents who feed birds during the inclement season. Usually by late February the northward movement from Massachusetts toward Canada has begun.

Tree Sparrows are occasionally heard singing when deep snow covers the ground. The song is among the sweetest of sparrow notes, slightly resembling that of the Fox Sparrow. The full chorus of a flock in winter is a sound worth going far to hear.

The habits of the Tree Sparrow in its northern home are little known. Its food while with us consists largely of weed seeds and the seeds of grasses that are considered as weeds. Years ago Professor F. E. L. Beal, in an article contributed to the "New York Tribune," gave a carefully studied statement of the weight of weed seeds eaten by Tree Sparrows in Iowa. He estimated very conservatively that these birds consumed 875 tons of such seed during their winter stay in the state. Mrs. J. E. Richards, of South Deerfield, Massachusetts, informs me that Tree Sparrows eat the seeds of tobacco freely.

Economic Status. As the animal food of the Tree Sparrow while in the United States forms but two per cent of the whole, it is of little use here as an insect eater. Such economic importance, therefore, as may be attributed to it while here, relates chiefly to its seed-eating propensities. The only harm ascribed to it is the destruction of millet seed, where millet is left outdoors in the "shock."

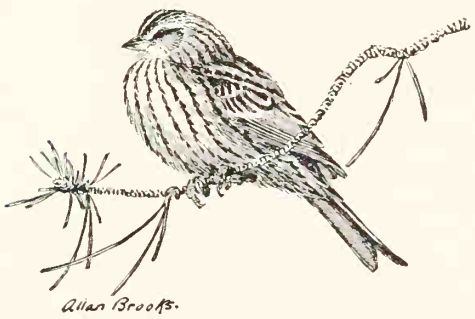
* Mr. Stuart T. Danforth believes he found a nest of this species, which the birds were building late in May, 1916, in Temple, New Hampshire. On August 12, 1922, he found a pair of these birds apparently breeding in some "slash" at Jaffrey. Whenever he approached a certain spot the birds became much alarmed, fluttering as close to him as they dared. Neither of these occurrences constitute authentic breeding records, as the data are incomplete.

Spizella passerina passerina (Bechstein). Chipping Sparrow.

Other names: CHIPPY; CHIP-BIRD; HAIR-BIRD.

Plate 71.

Description. — Similar in shape to Tree Sparrow but much smaller, and wing decidedly longer than tail. *Adult male:* Light brown or drab above streaked with black and rusty-brown; top of head plain rusty-brown to chestnut; a broad stripe over eye, ring around it, chin and upper throat very pale gray or whitish; rest of sides of head, sides of neck and under plumage pale grayish or grayish-white, deepening somewhat on sides of neck, across breast and on sides and flanks; lesser wing-coverts mouse-gray with darker or dusky centers; middle wing-coverts dusky with brown edges, and longer ones with white or pale tips; greater wing-coverts dusky with pale brownish edges and similar white tips; flight-feathers dusky with brownish edges and tips, these widest on tertials; tail dusky with light grayish feather-edges; bill variable, usually dark brown or blackish, sometimes paler at base below (usually black in spring, in winter lower mandible flesh-colored); iris brown; legs and feet flesh-color or light brown to dusky; legs and feet pale flesh-color (Wilson). *Adult female:* Similar to male, but sometimes duller. *Adults in winter plumage:* Marking less distinct, and chestnut of head somewhat veiled by buffy feather-tips and spotted or streaked black. *Young in first winter plumage:* Similar to adults in winter, but generally duller and browner, though heavily streaked with black on back; top of head not so reddish, and finely streaked with blackish, stripe over eye darker and not prominent, sides of head browner; wing-bars pale brownish; sides of breast sometimes marked crosswise with brown; bill dark brown above, fleshy-brown below; legs flesh-colored (Wm. H. Phelps). *Young in juvenal plumage:* Similar to first winter plumage, but more streaked with blackish on sides of head, and so streaked below, except abdomen; sides tinged reddish; "bill and feet pinkish-buff, the former growing dusky and the latter wood-brown with age" (J. Dwight).



Chipping Sparrow, Juvenile.

Measurements. — Length 5.00 to 5.85 in.; spread 8.00 to 9.00; folded wing 2.60 to 2.90; tail 2.18 to 2.40; bill .33 to .42; tarsus .55 to .73. Weight 14.64 grams (G. D. Chamberlain). Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt, completed after bird is fledged; first winter plumage by partial postjuvenal molt (August, September) involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (March, April) chiefly of head, chin and throat, and by wear, when bird becomes virtually as breeding adult; adults molt completely in August and September and partially (about the head like young) in spring (March, April).

Field Marks. — Smaller than Song Sparrow or Tree Sparrow or even Field Sparrow; tail slightly forked. *Adult:* Top of head chestnut, brighter than in Tree Sparrow, and sides of head more strongly marked than in either Tree or Field Sparrow; broad *white line over eye and black streak through it;* much like other sparrows above, with two white or pale wing-bars, but plain unmarked grayish or ashy below; bill blackish. *Young:* Nestling and juvenal finely streaked on sides of head and below, and head not strongly marked; in first winter plumage top of head not so bright as in adult, and streaked blackish but not streaked below; generally duller than adult.

Voice. — Alarm note a *tsip* or *chip;* also a not entirely unmusical twitter; song a string of dry *chips,* sometimes given slowly, and sometimes so rapidly that they almost run together like a trill; rarely a bird will interpolate or add some unusual improvised musical notes.

Breeding. — Chiefly about the habitations of man, where horse-hair for nesting may be found, on farms, in orchards and in village streets, sometimes in woodland glades. *Nest:* Usually in either deciduous or coniferous tree, or bush or vine, from 1 to 25 feet up, very rarely on ground; built chiefly of fine grass and rootlets, lined with hair of horse, cow or deer; sometimes fibers from milkweed or thistle are used. *Eggs:* 3 to 5; .68 to .80 by .48 to .55 in.; oval or ovate; greenish-blue or bluish-green, dotted, spotted and lined, chiefly about large end, with black or blackish and fewer marks of lilac; figured by E. A. Capen in "Oölogy of New England," Plate X, Figs. 1, 2. *Dates:* May 12 to June 26, Massachusetts; May 23 to June 2 (July), Maine. *Incubation:* Period 10 to 12 days; by both sexes, but chiefly by female. One or two broods yearly.

Range. — Canadian, Transition and Austral zones of eastern North America and west to the edge of the Great Plains. Breeds from northern Ontario, southern Quebec, Cape Breton Island and Newfoundland south to eastern Texas, central Louisiana, southern Mississippi, southern Alabama, central Georgia and southern South Carolina and west to eastern North Dakota and eastern Oklahoma; winters from Arkansas, Kentucky, southern Ohio, southern New York, New Jersey, southern Connecticut (casually) and southeastern Massachusetts (casually) to southeastern Texas, southern Alabama, southeastern Florida and casually to Cuba.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common migrant and summer resident. *Massachusetts, Rhode Island and Connecticut:* Common migrant and summer resident, accidental in winter.

Season in Massachusetts. — April 5 to November 9 (winter).

Haunts and Habits. The Chipping Sparrow is the little brown-capped pensioner of the dooryard and lawn, that comes about farmhouse doors to glean crumbs shaken from the tablecloth by thrifty housewives. It is the most domestic of all the sparrows. It approaches the dwellings of man with quiet confidence and frequently builds its nest and rears its young in the clustering vines of porch or veranda under the very noses of the human tenants. Here and there in the wilder parts of New England Chipping Sparrows may be found in forest openings or along the shores of lakes and streams, but most of them seem to prefer the vicinity of man's dwellings.

Its reiterated chipping is one of the earliest bird songs of the dawn, heard by the farmer as he rises for his day of toil in the fields. It is a simple, monotonous, soothing chant, sung hour after hour with the vigor, enthusiasm and abandon of the most accomplished musician; but it is rarely indeed that the bird produces any sound more musical than the simple string of *chips*. When the little birds are abundant, one singer regularly answers another on a slightly different key, so that the sound softened by distance seems gently to come and go like the breath of a sleeper in the fields.

Chippy is an early riser, often singing even before the Robin, and thus leading the morning chorus, but he does not antedate the Robin in his spring arrival. In fact he usually appears much later, in late April or May, after the early sparrows have come. We seldom see many Chipping Sparrows in New England before mid-April, and any too-previous bird of the species arriving earlier is likely to suffer with the cold. Thoreau says that he has seen one "come too early in the spring" sitting on a limb, shivering, and drawing in its head, striving to warm it in its muffled feathers, for it is not a hardy bird, and probably only very rarely attempts to winter in southern New England in some sheltered spot near the southernmost coast.

Wilson named the bird *Spizella socialis* in reference to its sociability with man, but it seems that Bechstein had previously named it *passerina* and according to the accepted rules of nomenclature this name now stands; nevertheless *socialis* seems more fitting, for we have no bird in New England that comes closer to human companionship. Now and then a male bird while hopping on a window sill sees his reflection in the glass, and at once attacks his supposed rival, tapping on the glass day after day, and sometimes hovering close to the glass as if trying to enter the house. Mr. Lester W. Smith tells of one that entered an open door and flew about the house from room to room, as if searching for something. Mr. Smith watched the bird tapping on a neighbor's window, and when he left, it followed him home and tapped on his; this it continued to do at intervals all through the breeding season.

Like the Robin it commonly nests in an apple tree in the back yard and feeds all summer about the house and barn, and some especially confiding individuals have learned to feed from the hand. Its rather fragile nest, which in good weather is built in three or four days, is lined usually with horsehair, and so lightly attached to the twigs that a sudden gust of wind may upset it or blow it away. Miss Viola E. Crittenden tells of a Chipping Sparrow at North Adams, Massachusetts, that had a nest not far from a Robin's nest under construction, and the little bird took interest enough in the domicile of her larger neighbor to bring straws and place them in the Robin's unfinished structure; and Mrs. Alice B. Harrington tells of a Chippy at Lincoln, Massachusetts, that built her nest in the old deserted nest of a Robin. These occurrences seem to be unique.

The egg of the Cowbird is very often deposited in the nests of Chipping Sparrows, which do not seem to resent the imposition, but, like the good foster parents that they are, tend and feed the young Cowbird until the great pot-bellied nestling is well able to care for itself. Both sexes join in the care and protection of the young, which are ready to leave the nest in about nine or ten days.

Mr. Laurence B. Fletcher contributes the following: "A nest containing young Chipping Sparrows was about five feet from the veranda in a low limb of an elm. The male bird wore a band. The female (unbanded) remained for over an hour at a time three or four inches from the nest, taking food that the male brought and feeding it to the young, which were nearly ready to leave the nest. She apparently did no hunting for food, and during an entire day (July 15th) only the male procured food. She remained quiet until she heard the call of the approaching male — then moved a little in the direction of his arrival, received the food, then turned to the nest and fed her young. The male made very frequent trips, for food was available within a short distance. The female was never seen to eat the food brought to her. It was always fed to the young, although it does not seem possible that she did not take for herself during the day some of the food furnished by her devoted mate."

When the fledglings can fly they are seen about the door for a time, and then the little company joins with others until considerable flocks are formed, which roam over the country until late September or early October, when the southward flight usually is well

under way. In August the young males begin to sing, and often their songs are unlike those of their elders; some are sweeter, others hoarse or harsh; Miss Agnes M. Learned tells of one that had something of the quality of the katydid.

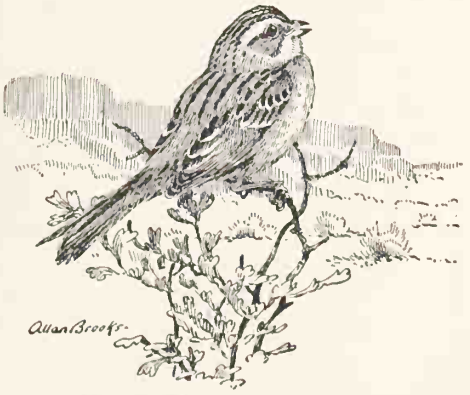
Mrs. E. S. Fowler, of Danvers, Massachusetts, wrote that she and her daughter were standing near the corner of the house, looking for birds, when they saw a small bird, apparently a Chipping Sparrow, hanging on a telephone wire under the projecting eaves. He hung upside down, clasping the wire tightly in his claws, back toward the eaves, breast to the observers, and calmly turned his head from side to side as he gazed around for two or three minutes, then with an easy upward motion righted himself and flew away.

The Chipping Sparrow feeds mostly on insects and grass seeds. It is a redoubtable enemy of the gipsy moth, army-worm, canker-worm, beet-worm, cabbage-worm, and pea-louse. Weevils, grasshoppers, locusts and other insect pests are its common prey. It feeds to repletion in autumn on the seeds of garden weeds and grasses. It seems fond of the seeds of such weeds as ragweed, purslane and plantain. It takes some berries, usually wild fruit, and occasionally one captures a few honey-bees (probably mostly drones).

Economic Status. The Chipping Sparrow is regarded everywhere as a useful tenant of the farm, and examinations of its food materials fully bear out the assumption.

Spizella bréweri Cassin. Brewer's Sparrow.

Description. — Shape near that of Chipping Sparrow, somewhat smaller, much paler and duller, with tail relatively longer, sides of head not distinctly striped, and other markings less distinct. *Adults (sexes alike)*: Above pale brown streaked with black; streaks narrowest on top of head, broadest on back and scapulars, least distinct on rump and upper tail-coverts; lesser wing-coverts dusky with light grayish-brown margins; middle and greater wing-coverts similar, broadly margined lighter on outer webs, and tipped buffy-whitish, the light tips forming two more or less distinct wing-bars; flight-feathers dusky, edged pale brownish-gray, most broadly on tertials; tail dark grayish-brown with light grayish-brown feather-edges; sides of head pale buffy-grayish with a darker central patch, including eye and ear region, leaving a light streak over eye, a dusky streak running back from behind eye and a less distinct dark streak down lower jaw (sometimes obsolete), all below this and all lower plumage as well, ashy-white, shaded across upper breast and along sides pale grayish-buffy; bill "lilaceous-brown"; iris brown; legs and feet light brown. *Young in first winter plumage:* Very much like adults but more buffy above, and tips of middle and greater wing-coverts decidedly buffy as in juvenal birds; iris brown; legs and feet flesh-color (S. Parker). *Young in juvenal plumage:* Similar to adults, but less sharply streaked above; upper breast streaked dusky, and tips of middle and greater wing-coverts buffy, forming two rather distinct wing-bars.



Brewer's Sparrow, Adult.

Measurements. — Length 5.00 to 5.60 in.; folded wing 2.35 to 2.55; tail 2.35 to 2.70; bill .32 to .38; tarsus .60 to .72. Female averages smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt, beginning in the nest; first winter plumage by partial molt, apparently not including wings or tail (July, August); adults apparently have a partial prenuptial molt (March, April) and a complete postnuptial autumnal molt.

Field Marks. — Size, shape and coloring somewhat similar to those of Chipping Sparrow, but paler, grayer, and markings less distinct; *no red cap, no broad white stripe over eye* or *black line through it;* top of head, like back, streaked with black; plain ashy-whitish below, slightly tinged buffy on breast and sides. *Young:* Similar, but wing-bars more buffy and breast slightly streaked.

Voice. — Call note "a weak *tseet*"; song more varied and more musical than that of Chipping Sparrow, remindful of some themes of song of Canary (Grinnell and Storer).

Breeding. — Chiefly among sagebrush. *Nest:* Low down in sage bush, built of dried grasses and rootlets, lined with hair. *Eggs:* 4 or 5; .70 to .80 by .49 to .55 in.; usually ovate; greenish-blue or bluish-green, much like those of Chipping Sparrow, but most of the spots and lines light yellowish-brown with rarely some black marks.

Range. — Western North America from southwestern Canada to central Mexico. Breeds mainly in Transition Zone from southeastern British Columbia, central-western Alberta and southern Saskatchewan south to northern Lower California, southern Arizona, central New Mexico and northwestern Texas, west to central Washington and Oregon and east to northwestern Nebraska and eastern Colorado; winters from central California, southern Arizona and central Texas through lower California and Mexico to Jalisco; accidental in Massachusetts.

Distribution in New England. — Accidental visitor. Record: *Massachusetts:* Watertown, December 15, 1873, a young male shot by Mr. William Stone, specimen now in collection of the Boston Society of Natural History.[1]

Haunts and Habits. Brewer's Sparrow is a bird of the high sagebrush plains of the far west, where it nests, and of the deserts of the southwest, where it winters. Occasionally some of them work up into the mountains. Their habits seem to be similar to those of other sparrows of the plains. Their occurrence in the east is accidental.

Economic Status. See page 2.

Spizella pusílla pusilla (Wilson). Field Sparrow.

Other names: bush sparrow; huckleberry bird.

Plate 71.

Description. — Form like that of Chipping Sparrow, but averaging larger, and duller in color with no black and white striping about head; wing not longer than tail. *Adults (sexes alike):* Above more or less rusty, and top of head and hind neck unstreaked; rusty cap divided by a grayish central streak; sides of head light gray with buffy eye-ring, a rusty-brown streak behind eye, and some touches of same around ear-coverts; back and scapulars rusty-brown streaked black, feathers often edged light buffy; rump and upper tail-coverts mostly plain light brown; wings generally dusky, the feathers edged with brown, whitish tips of middle and lesser wing-coverts forming two light wing-bars; tail deep hair-brown with grayish feather-edges; below whitish, becoming pale brownish on upper breast, sides and flanks; wing linings whitish; there is some seasonal variation, as like most sparrows they are paler in spring than in autumn; bill light reddish or pinkish; iris dark brown; legs and feet flesh-color or pale brownish; "bill and legs reddish-cinnamon" (Wilson). *Young in first winter plumage:* Virtually as adults. *Young*

[1] Brewster, William: American Naturalist, Vol. VIII, 1874, pp. 366, 367.

Photograph by Harry G. Higbee

FIG. 72. — NEST AND EGGS OF FIELD SPARROW

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Photograph by Harry G. Higbee

FIG. 73. — NEST AND EGGS OF TOWHEE

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in juvenal plumage: Similar to adults, but duller; crown not rusty, but brown, little (or not) streaked; lower throat, upper breast and sides indistinctly streaked dusky.

Measurements. — Length 5.10 to 6.00 in.; spread 7.75 to 8.50; folded wing 2.12 to 2.75; tail 2.20 to 2.80; bill .32 to .40; tarsus .65 to .74. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt in the fledgling; first winter plumage by postjuvenal molt (September) involving body plumage and wing-coverts and not usually flight-feathers or tail, but one specimen examined was molting both; first breeding plumage by wear; adults have one complete postnuptial molt (August, September) and acquire breeding plumage by wear.

Field Marks. — Size near Chipping Sparrow; bill pinkish; tail slightly forked. *Adults and young in first winter plumage:* Much like Tree Sparrow, but wing-bars not so white, and head, throat and breast more brown than gray; lacks the *dark spot on breast* seen on Tree Sparrow, and has no black and white stripes on side of head such as Chipping Sparrow shows. *Young in juvenal plumage:* Somewhat like young Chipping Sparrows, but not so distinctly streaked on cap and breast.

Field Sparrow, Juvenile.

Voice. — Call note, a *tsip* not so hard and sharp as that of Chipping Sparrow; song, a pensive strain, often varied; usually begins with a few slow, high, clear, prolonged slurred notes, then accelerates, and finally trails off *diminuendo* in rapid repetitions, fading as its ends; some songs are all on the same note, others rise or fall; W. L. Dawson expresses a common rendition thus, *he-ew, he-ew, he-ew, he-ew, hew, hew, hew, he heeeeu.*

Breeding. — In open, bushy, old fields and berry pastures chiefly, or in undergrowth near borders of woods. *Nest:* In low bush such as a huckleberry, in a brier patch or on ground, rarely 5 to 10 feet from ground in tree, or in currant bush in some garden; built mainly of dried grasses or weeds, often lined with horse or cow hair. *Eggs:* 4 or 5; .61 to .74 by .48 to .56 in.; ovate; grayish-white or bluish-white, spotted and dotted with light reddish-brown and lilac; figured by E. A. Capen in "Oölogy of New England," Plate X, Figs. 3, 4. *Dates:* May 19 to June 11, Rhode Island; May 8 to June 12, Massachusetts. *Incubation:* Period 13 days (F. L. Burns); chiefly by female. Two broods yearly; in many cases three. (See Fig. 72.)

Range. — Southeastern Canada and eastern United States west to the Mississippi Valley. Breeds in Transition and Austral zones from central Minnesota, Wisconsin, northern Michigan, southeastern Ontario, southern Quebec, Prince Edward Island and Nova Scotia south to central Texas, Louisiana, southern Alabama and northern Florida and west to eastern Nebraska, central Oklahoma and central Texas; winters from central Missouri, southern Illinois, southern Indiana, southern Pennsylvania, central New Jersey, southeastern New York, Connecticut and Massachusetts south to the Mexican states of Coahuila and Tamaulipas, northeast southern Texas, southern Louisiana, southern Alabama and southeastern Florida.

Distribution in New England. — *Maine:* Locally common to rare summer resident in southwestern counties. *New Hampshire:* Locally common summer resident north to valleys of White Mountains. *Vermont:* Locally common summer resident. *Massachusetts:* Common migrant and summer resident; casual in winter, mostly in southeastern coastal region. *Rhode Island:* Common migrant and summer resident; probably winters rarely. *Connecticut:* Common migrant; common to abundant summer resident; rare winter resident.

Season in Massachusetts. — April 5 to November 28 (winter).

Haunts and Habits. On bright June days, when heat waves reflected from the warm ground shimmer over the landscape, the Field Sparrow sings. The clear, sweet, pensive chant carries far on still days, and comes down to the valley from bushy, hillside pastures and dry old fields along the edges of the woods. He sings from a huckleberry bush, from a tall weed, a fence-top, or some small birch or other pasture tree. The lay is simple but it is one of the sweetest of the sparrow songs. Rev. J. H. Langille says of it: "The song is quite constantly repeated at short intervals, and has a rather melancholy but soothing and pleasing effect, which sensitive natures readily recognize, and do not easily forget. It is the homely, pensive poetry of the thicket, that line of land where the cultivated beauty and fertility of the fields end, and the solitude and gloom of the forest begin."

Straggling Field Sparrows are seen sometimes in southern New England in March, but it is not until the latter part of April that these birds usually appear in small flocks, feeding about weedy gardens and fields. During the summer, while the birds are occupied in raising their young, they are by no means such domestic birds as the Chipping Sparrows. Instead of nesting about the domiciles of man, they usually retire to old fields and bushy pastures, or low thickets along the edges of woodlands, though occasionally a pair may select some neglected garden for the home site. Mr. C. A. Clark found at Lynn, Massachusetts, a Field Sparrow's nest built on the old nest of a Chestnut-sided Warbler — a very exceptional occurrence.

The young, like those of most ground-nesting birds, develop very rapidly. If undisturbed they may remain in the nest for nine or ten days, but if molested they may leave it by the fifth or sixth day, when they run away and hide in the grass. When the young have been reared, they repair to weedy cultivated fields, hayfields and gardens, where in the manner of Tree Sparrows they feed largely on the seeds of weeds. By September they have gathered in flocks, and soon the southward movement begins. But flocks are still passing during most of October, and a few stragglers remain later. Some of them winter occasionally along the coast of southern New England, and on the Elizabeth Islands south of Cape Cod.

Dr. Sylvester D. Judd finds that animal matter constitutes 41 per cent of the Field Sparrow's food and that this animal matter consists mostly of insects. It eats click beetles, May beetles, leaf-beetles, grasshoppers, leaf-hoppers, bugs, saw-flies, ants, flies and spiders. I have known it to feed on plant-lice, tent caterpillars and canker-worms and the caterpillar of the brown-tail moth. It feeds largely on the seeds of grasses, and to a much less extent on those of garden weeds, and takes a small quantity of grain. Its feeding habits are much like those of the Chipping Sparrow, though it destroys more parasitic insects.[1]

Economic Status. The Field Sparrow is a useful bird, though probably somewhat less so than the Chipping Sparrow.

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 78–80.

Júnco aíkeni Ridgway. White-winged Junco.

Note. There seems to be no record of the *taking* of this bird in New England. This is a well marked species, readily identified in the field, and there are in letters in the files of the Massachusetts Department of Agriculture several reports of the species which seem credible, but as there is always the possibility of a mistake due to partial albinism, the bird must be relegated to the hypothetical list. We have four "sight records" of the occurrence of this species in New England. The observers are reliable and had every opportunity to watch the specimens, but it seems best to refuse this species a place in the New England list, until a specimen taken and preserved can be recorded.

Vermont: Waterbury, March 29 and 30, 1919, five or six seen by Dr. G. A. Bidwell. *Massachusetts:* Hatchville, February, 1920, bird observed by Wilfred Wheeler; Falmouth, February 8, 1920, bird seen by Dr. L. C. Jones "on his doorsteps" (possibly the one seen by Mr. Wheeler); Brookfield, October 19, 1924, one seen by Miss Clara Everett Reed.

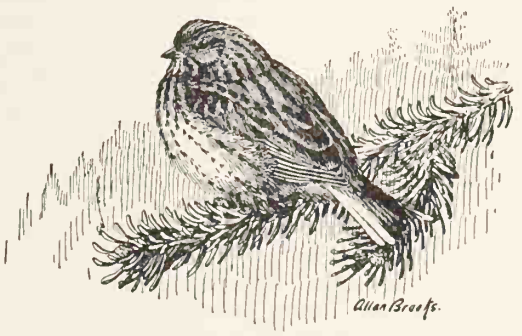
Junco hyemális hyemalis (Linnæus). Slate-colored Junco.

Other names: junco; snowbird; black snowbird; gray snowbird.

Contributed by Dr. John B. May.

Plate 71.

Description. — Between Song Sparrow and Chipping Sparrow in size. *Adult male:* Upper parts (except tail), head, neck, chest, upper breast, sides and flanks uniform dusky-neutral-gray or slaty (often somewhat darker on head and lighter on rump); lower breast, abdomen, crissum and under tail-coverts white, unmarked; six central tail-feathers slaty or sooty-blackish, edged with slaty-grayish, two outer pairs white, second pair sometimes partly dusky, third pair white and dusky; bill pinkish-white or flesh-color, usually with a dusky tip; iris dark reddish-brown or claret-purple; tarsus light brownish with (usually) darker toes. *Young male in first winter plumage:* Similar to adult male but tinged somewhat brown above; sides and flanks tinged buffy-brown or cinnamon, and feathers of chest etc., often tinged with same. *Adult female:* Much like adult male, but usually lighter gray and with second pair of tail-feathers almost always partly dusky; very little seasonal variation in plumage of fully adult birds, though summer plumage may average darker than winter, and dusky tip to bill may be lacking in breeding season. *Young female in first winter plumage:* Still browner than young male; upper parts "rufescent-broccoli-brown"; sides and flanks more or less tinged light vinaceous-cinnamon; gray of chest etc., suffused with same; broad edgings of tertials wood-brown; white of under tail-coverts, etc., tinged buffy. *Young in juvenal plumage:* Above grayish-brown or drab (sometimes slightly rufescent on back), rather broadly streaked blackish; chin, throat, chest, sides and flanks pale dull buffy or buffy-grayish, spotted or broadly streaked dusky (except on chin); rest of under parts white, breast usually more or less spotted or streaked dusky; wings and tail as in adults, but greater wing-coverts and tertials broadly edged cinnamon-brownish, the former with lighter terminal spots (R. Ridgway).



Slate-colored Junco, Juvenile.

Measurements. — Length 5.75 to 6.50 in.; spread 9.25 to 10.00; folded wing 2.75 to 3.25;

tail slightly shorter than wing; bill .38 to .45; tarsus .80 to .85. Average weight, 21.68 grams (C. L. Whittle). Female smaller than male.

Molts. — Streaked plumage of juvenal bird is changed to first winter plumage by almost complete postjuvenal molt, only tail and flight-feathers retained. "There is no spring molt, and the summer plumage, with its more sharply contrasted areas of slate-color and white, is the result of the wearing away of the brownish tips of the winter plumage" (F. M. Chapman). In second fall molt, bird becomes much darker but gray areas on sides and flanks are still narrow, and there is considerable brownish edging to feathers, especially across lower nape and upper back and on secondaries; by spring these edgings have been worn off to produce clear slaty of breeding season; very little or no brownish is apparent after third fall molt, and gray on sides and flanks is noticeably wider, with a corresponding reduction in the white area on the under plumage (C. L. Whittle).

Field Marks. — Song Sparrow size. *Adults:* Slate-colored upper plumage and breast, sharply defined against white under plumage, white outer tail-feathers, and pinkish white bill, render it easily distinguishable from all birds except other species or races of juncos. *Immature* or *first winter* birds, especially young females, sometimes have pinkish-brown sides and some have been reported as Pink-sided Juncos, but latter would show comparatively clear gray on head and breast, while immature Slate-colored Juncos would have breast heavily washed with brownish. Other western species and races are reddish-brown across back but the head is black, making a more decided contrast than is shown by our eastern bird.

Voice. — Besides a variety of *chirps*, a characteristic "*smacking*" or "*snapping*" note, given most often in spring and summer, and a "*clink*" which can be well imitated by striking two coins or pebbles together sharply; two quite different types of song, a simple trill suggestive of that of Chipping Sparrow or Pine Warbler, and another less frequently heard song, a low sweet melody described by E. P. Bicknell as "a faint, whispering warble, usually much broken, but not without sweetness."

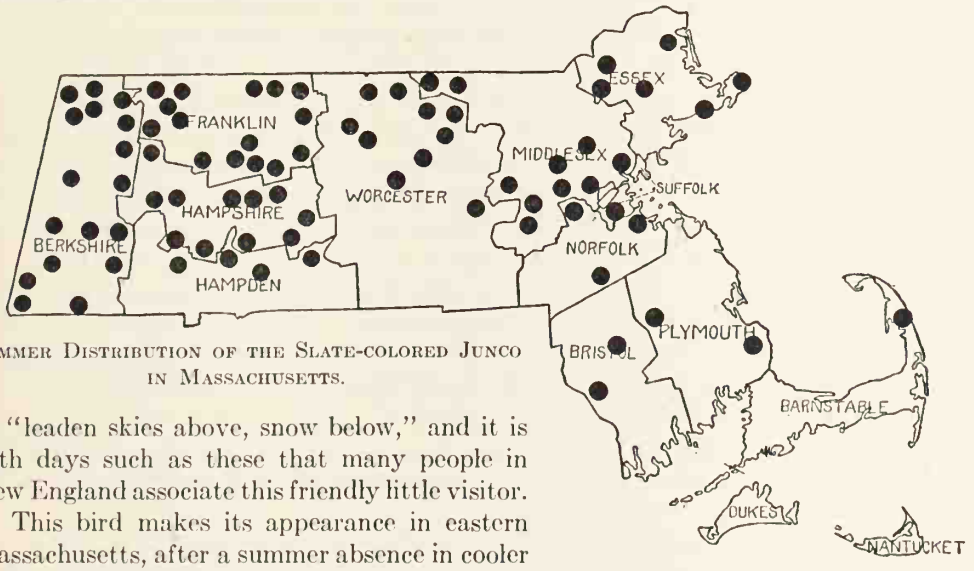
Breeding. — In woods or in brushy thickets or overgrown fields. *Nest:* Usually on ground, occasionally slightly raised, often on a steep slope and concealed behind overhanging roots, etc.; made of grasses, roots, shreds of bark, etc., with lining of finer grasses and rootlets, occasionally of hair of cattle or deer. *Eggs:* 4 to 6; about .80 by .60 in.; oval to rather broadly ovate; ground color bluish, greenish, or grayish-white, thickly spotted with fine markings of lilac, purplish, sienna and different shades of brown, especially about larger end where they usually form a wreath; figured by E. A. Capen in "Oölogy of New England," Plate IX, Figs. 14, 15. *Dates:* April 25 to July 1, Virginia; last of May, Massachusetts; May 1 to late June, Maine; June 27, southern Labrador. *Incubation:* Period 11–12 days. One or two broods yearly.

Range. — North America. Breeds in Hudsonian and Canadian zones from tree limit in northwestern Alaska, northern Mackenzie, northern Manitoba, northern Ontario, southern Ungava (Quebec) and central Labrador south to base of the Alaska peninsula, southern Yukon, northern British Columbia, central Alberta, south-central Saskatchewan, southern Manitoba, central Minnesota, southern Wisconsin, central Michigan, southeastern Ontario, Pennsylvania, southern New York, Massachusetts and southern Connecticut (casually); south in migration through British Columbia, and most of United States; winters from western Washington, Colorado, southern South Dakota, central Minnesota, Wisconsin, central Michigan, southeastern Ontario, New York, southern Quebec (casually), Maine and Nova Scotia to northern Lower California, New Mexico, southern Texas, southern Alabama, and southeastern Florida; casual in northeastern Siberia and in the Bermuda Islands.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common summer resident and common migrant in northern counties, less common winter resident and breeding bird in southern counties. *Massachusetts:* Abundant migrant; locally common summer resident in western highlands, rare summer resident in eastern counties; fairly common winter resident. *Rhode Island:* Common migrant and winter resident. *Connecticut:* Common migrant and winter resident; rare summer resident (Salisbury, Hadlyme, Union, Canaan).

Season in Massachusetts. — Although considered a migratory bird, this species is represented at all seasons in some parts of the state. While it is usually taken for granted that our winter resident Juncos have come from Canada or northern New England, the recovery on May 20, 1922, at Buckland, Massachusetts, of a Junco banded by Mrs. G. A. Burbank at Sandwich, Massachusetts, during the preceding winter, suggests that in some instances at least their migration is influenced by altitude as much as by latitude.

Haunts and Habits. A bleak gray day in early winter — bare trees standing stark and black against a background of white snow — a cold wind sweeping across the drifted fields — and in a sheltered, brush-filled corner, a flock of lively little gray and white birds fluttering and twittering together. The Slate-colored Junco has been aptly described



Summer Distribution of the Slate-colored Junco in Massachusetts.

as "leaden skies above, snow below," and it is with days such as these that many people in New England associate this friendly little visitor.

This bird makes its appearance in eastern Massachusetts, after a summer absence in cooler regions, as the leaves begin to fall, and it is usually an abundant autumn migrant, haunting neglected, bush-covered fields and weed-grown gardens, in company with various other seed-eating sparrows and finches. Although the majority of Slate-colored Juncos soon pass on toward the south, some remain, and with the advent of the first snowstorm or the first real cold weather abandon the windswept weed patches and seek the bounty spread on window shelf and doorstep by their friends of the ever-growing army of bird lovers. While the cold weather continues, they usually confine themselves quite closely to a well-defined range, seldom journeying farther than from the feeding station to a neighboring weed patch for a change of diet or for the fine gravel which is so essential to their well-being, or to a clump of bushes or thick evergreens where they can roost and find shelter from the searching winds and driving snow.

These feeding stations furnish excellent opportunities to study the birds at close range and much information can be obtained by a patient watcher. Through the activities of bird-banding enthusiasts in particular, considerable light has already been thrown upon

certain little known phases of avian history. Mr. Charles L. Whittle, at his banding station in Cohasset, Massachusetts, began a study of the molting sequence in the plumage of the Slate-colored Junco in New England, following the changes in individual birds through several seasons of "returns." He found that the bird takes at least three years to assume its fully adult winter plumage. His deductions agree with my own observations of banded birds at Thomasville, Georgia, where I was able to recognize one old bird which frequently "repeated," by its uniform high color, without any brownish tinge, even before removing it from the trap and reading its band number.

The migration of birds brings up many unanswered questions, but the banding stations are also beginning to throw light upon some of these. On February 4, 1924, Mr. Laurence B. Fletcher of Cohasset, Massachusetts, caught in one trap together, twelve Slate-colored Juncos. Three were unbanded birds, but the other nine wore bands placed upon them by Mr. Fletcher the previous winter. Reference to his records showed that six of them were part of a group of fourteen Juncos caught together in the same trap on the morning of January 25, 1923, one of them was banded on February 7, and the other two on February 10, 1923, all at the same place. On February 10, 1924, six days after this interesting "recovery," four of the six birds banded January 25, 1923, were again captured by Mr. Fletcher.

Occurrences of this sort, where a group of birds were banded together and a year later recovered together, suggest that these birds had traveled together *as a group* for over a year, at least. Perhaps the group had formed on the breeding ground, migrated together to Cohasset or farther south, returned in spring to their breeding range in the north, and migrated together a second season to Cohasset, keeping the flock intact through all that time. Some day, when bird-banding has become more general, we may learn the complete story, which today is merely suggested by a few scattered bits of evidence, like the above from Mr. Fletcher.

With the return of warmer weather in spring, the winter resident Juncos leave the neighborhood of houses for fields and the edges of woodlands, where they are joined by birds which have wintered farther south, and the augmented flocks continue their journey to their breeding grounds. While numbers nest in the highlands of western Massachusetts, the majority seek northern New England or Canada. This Junco is a characteristic bird of the great spruce forests of Maine and of the shady ravines of the White and Green Mountain regions. Although a preference is usually shown for cool damp woods, the nest is sometimes located in an open blueberry pasture, among the piles of "slash" in a lumber clearing, or among the buildings of a deserted logging camp.

Though a friendly and confiding bird in cold weather, it is ordinarily rather retiring in the breeding season, but Mrs. William A. Russell of Townsend, Massachusetts, writes that in 1926 a pair of Juncos built their nest and reared their brood inside a woodshed at the back of her house. The nest, made of fine dry grasses, was placed on a narrow shelf just above the door where it formed a corner with the side wall. Mr. Arthur Gibson in the "Ottawa Naturalist" for November, 1908, describes another nesting site as follows:

"While at Armstrong's Point, Youghall, Nova Scotia, in June last, I was surprised to see a nest of the Slate-colored Junco (*Junco hyemalis*), built on a ledge beneath the gable of the house in which I was staying. The nest was situated about ten feet from the ground and the house was partly surrounded by the edge of a spruce grove." Such a location, while unusual, is not very different essentially, except for the presence of human beings, from a niche in a steep cliff, a situation frequently selected by this bird.

The Gray Snowbird is probably the only bird which nests above tree limit in the White Mountains of New Hampshire, but there it may be found in summer, perfectly at home on the bare rocky cone of Lafayette or picking up crumbs dropped by tourists around the railroad station at the summit of Mt. Washington. On the 5th of August, 1926, I climbed, with a party of camp boys, up the rugged Tuckerman Ravine Trail from Pinkham Notch to the top of Mt. Washington. On the way up the trail, we heard at frequent intervals the ecstatic song of the Winter Wren, the silver notes of the Hermit Thrush, the lisping calls of Golden-crowned Kinglets, and the songs of various forest-loving warblers, among which we distinguished the Myrtle, Magnolia and Black-throated Blue Warbler. As we neared the region of stunted spruces and balsam firs about Hermit Lake, we were greeted by several small groups of Slate-colored Juncos, busily engaged in searching for food among the dense evergreens. Whole families of streaked, sparrow-like young birds, in the juvenal plumage, were calling from the thickets, and for some time we paused and watched the old birds bringing insects to their hungry offspring. As we proceeded up the ravine, we passed other groups, until, just below the rocky headwall of Tuckerman's, we came to the snowfields, at that late date still covering several acres. There, in the span of a few yards, we could pass from late winter to midsummer. Close beside the fields of snow, last year's grasses lay brown and dead; a few feet away the alder catkins and pussy willows were just coming into blossom and violets were nodding in the cold wind; beyond these, we found the yellow mountain avens and the tall white bog orchid, *Habenaria dilatata*, in bloom, and a little farther still, great showy sprays of mountain goldenrod waved in the breeze or bowed beneath the dainty weight of a silver and brown mountain fritillary butterfly. Close at hand, we heard the calls of nesting Blackpoll Warblers, while all around the snowfields sounded the smacking notes of the ever-present Juncos. One of the latter drank from "the Stream of a Thousand Falls," which is formed by the melting of the snow, and then bathed in the frigid waters with much fluttering and splashing of spray, reminding me of other Juncos which I have watched in midwinter, similarly engaged in bathing, but in light dry snow, just as other sparrows take dust baths in hot weather.

Reluctantly we left this region of summer snow, and clambered up over the steep headwall trail to the Alpine Gardens and across the broken rock of the windswept cone to the summit of New England's highest mountain. And there, higher even than we could climb, perched on the very ridgepole of the hotel at the tiptop of Mount Washington, was a gray and white midget of a bird, greeting us with its cheery Junco song, the only bird which is regularly found in summer in this barren place.

Nearly half of the Slate-colored Junco's food in summer is made up of insects, with a few spiders and other small invertebrates. While it eats a few useful parasitic hymenoptera, its animal food consists chiefly of leaf-beetles, weevils, caterpillars, grasshoppers, true bugs, leaf-hoppers, click beetles, longicorn beetles and ants. At this season it also eats many kinds of seeds, berries and small fruits. In winter its food consists almost entirely of seeds with a few dried berries, and it consumes in the aggregate a tremendous quantity of seeds of weeds which, without this check upon their abundance, would make agriculture much more difficult. According to the Biological Survey, about one-third of the winter food is composed of grass seeds and small grains, one-third of ragweed and polygonums, and the balance of seeds of such weeds as "amaranth, lambs' quarters, chickweed, purslane, tick-trefoils, vetch, gromwell, wood sorrel, sedge, sheep sorrel, wild sunflower and Russian thistle." [1]

Mr. Milton P. Skinner writes of the bird's feeding habits in the South: "During the winter the Juncos eat the seeds of broom sedge, crab-grasses, pigeon grass, and countless other similar seeds. They eat the pulp of dogwood berries, but reject the seeds, sumac berries, occasional sips of persimmon pulp, berries of the sour gum trees, and privet and cedar berries. No doubt they also eat many insects while searching for seeds and berries." [2]

Economic Status. While in summer this bird eats a few useful parasitic insects, it probably does much more good by destroying spruce-bud worms, pine weevils and other forest insects which are very destructive to growing timber. In winter and during its migrations it visits agricultural lands and devours an immeasurable quantity of noxious weed seeds. What little grain it may pick up at this time is waste seed culled from the stubble after the crops are harvested. Where cosmos and other late-flowering plants are raised for seed, the Junco and its fellow seed-eaters may not be welcome, but such instances only serve to emphasize the birds' generally useful habits.

Junco hyemalis oregánus (J. K. Townsend). **Oregon Junco.**

Description. — A typical male of this race is thus described by Dr. Jonathan Dwight, Jr.: "Whole head and breast black; the back mummy-brown; sides and flanks washed with light vinaceous-cinnamon; the rump deep neutral gray; lower parts, except breast and sides, white; the two outer pairs of tail-feathers and a dash on the third are white; bill and feet flesh-color; iris brown." [3] Females and young of this race are extremely variable.

Measurements. — "Wing, 79 mm.; tail 70 mm.; tarsus 21 mm.; toe with claw 21 mm.; culmen 11 mm.; depth of bill at base 6 mm." (J. Dwight).

Distribution in New England. — Accidental visitor. Record: *Massachusetts:* Wellesley, January 28, 1919, bird taken and recorded by Prof. Albert P. Morse.[4]

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[1] Judd, S. D.: United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 81, 82.
[2] Skinner, Milton P.: A Guide to the Winter Birds of the North Caroline Sandhills, 1928, p. 199.
[3] Distribution of Color in the Genus Junco, Bulletin, American Museum of Natural History, Vol. XXXVIII, 1918, p. 291.
[4] Bulletin, Essex County Ornithological Club of Massachusetts, Vol. II, 1920, p. 13.

NOTE. Several sight records of "Pink-sided Juncos" have been received, including the specimen recorded above, but that is the only bird actually collected. This specimen is now on exhibition in the mounted collection of the Boston Society of Natural History, but labelled "*Junco oregonus couesi* (DWIGHT). *Coues' Western Junco.*" As this race has not yet been recognized by the American Ornithologists' Union, the bird is listed as above, and no attempt is made here to define the range of this bird, whose occurrence in New England is that of a purely accidental straggler.

Junco hyemalis montánus RIDGWAY. Montana Junco.

DESCRIPTION. — Similar in form and proportions to Slate-colored Junco. *Adult male:* Head, neck and upper breast slate, darker above, especially on top of head, where sometimes nearly slaty-black; lores blackish; back and scapulars brown; rump and upper tail-coverts gray; outermost pair of tail-feathers entirely (or nearly all) white, second pair chiefly white, third pair with a little white toward end of inner web, six central tail-feathers dusky with gray edges; flight-feathers chiefly dusky; tertials and coverts edged brown; sides and flanks pinkish-cinnamon, rest of lower plumage white; bill pinkish-white; legs light brown, toes darker. *Adult female:* Similar to male, but usually duller; head, neck and chest average a little lighter in color; some tinged grayish-brown on hindhead or hind neck. *Young in first winter plumage:* Similar to adults but duller; tertials and innermost greater wing-coverts browner; greater wing-coverts with pale spot at ends of each; feathers of upper breast with brownish end-margins; bill darker.

MEASUREMENTS. — Length (dried skins) 5.15 to 5.75 in.; folded wing 2.80 to 3.20; tail 2.60 to 2.77; bill .38 to .45; tarsus .71 to .85. Female smaller than male.

MOLTS. — Probably similar to those of Slate-colored Junco, but not enough molting specimens available to determine properly.

FIELD MARKS. — Much like Slate-colored Junco but browner on back and wings, and lighter on sides.

VOICE AND BREEDING. — Probably similar to Slate-colored Junco.

RANGE. — Rocky Mountain region and casually east to Atlantic coast. Breeds in Canadian Zone from southern Alberta south to south-central Idaho and western Montana; winters from Arizona, New Mexico and Texas south to Sonora and Chihuahua; casual west to eastern Oregon and eastern California and east to Kansas, Minnesota, Michigan, Illinois, Indiana, Maryland and Massachusetts.

DISTRIBUTION IN NEW ENGLAND. — Accidental visitor. Record: *Massachusetts:* Watertown, March 25, 1874, bird taken by William Brewster.[1]

NOTE. The systematists, in the attempt to classify the various forms of juncos in North America, have divided them into many species and races. How many of these forms will stand the test of time we can only conjecture.

The bird collected at Watertown, Massachusetts, was originally recorded as *Junco hyemalis oregonus.* Then the race was raised to specific rank under the title *Junco oregonus.* Later the systematists subdivided *Junco oregonus* into several geographic forms, and William Brewster in a footnote in the second edition of Minot's "Land Birds and Game Birds of New England" (1895, p. 234) notes that the Massachusetts specimen proved "on re-examination to be a typical example of *Junco hyemalis shufeldti* (COALE), a form very closely related to the true *oregonus* from which it was separated after the original determination of the Watertown specimen was made." In 1898 Robert Ridgway described the Montana Junco, *Junco montanus,*[2] and the Massachusetts specimen was then assigned to that alleged species by Mr. Ridgway himself, though Mr. Brewster still doubted the validity of the species, believing that it was very closely related to *shufeldti.*[3] However, the Committee on Nomenclature of the American Ornithologists' Union later decided that the Montana Junco was not properly entitled to specific rank, and it was listed

[1] Bulletin, Nuttall Ornithological Club, Vol. I, 1876, p. 19.

[2] Auk, Vol. XV, 1898, p. 321.

[3] Birds of the Cambridge Region, 1906, p. 283.

in the Check-List (1910) as a geographic race of *Junco hyemalis*, and our specimen then became *J. h. montanus*, under which cognomen let us hope it may be allowed to rest in peace.

— Since the above was written I have looked up the original specimen, and have found it in the Museum of Comparative Zoölogy, at Cambridge, Massachusetts, assigned to a tray filled with *Junco shufeldti*, and labelled by Mr. Brewster as *Junco hyemalis connectens*. On referring the matter to Mr. Outram Bangs of the Museum staff, he assigns the bird now to *Junco oreganus couesi*. Thus if the American Ornithologists' Union recognizes *couesi*, this specimen recorded above as *Junco montanus* will become Coues' Western Junco like the "Oregon Junco" mentioned previously. In any case it will go to the collections of the Boston Society of Natural History, perhaps to be exhibited side by side with the other Massachusetts specimens now on exhibition there.

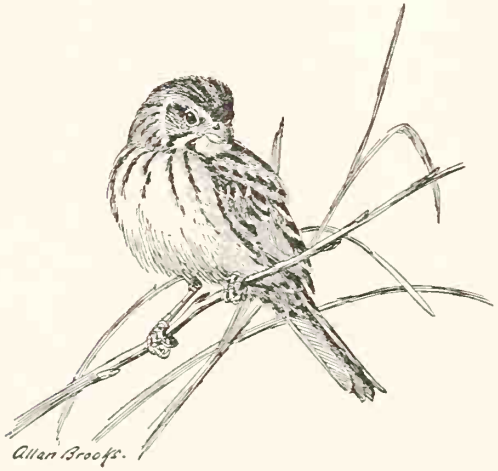
The haunts and habits of this race appear to be similar to those of the Slate-colored Junco. Both this specimen and the "Oregon Junco" previously described were found feeding with groups of the typical Slate-colored Junco. Mr. Brewster's specimen was selected by chance from a large flock of Juncos, with no idea before the bird was in his hands, that it would prove to be the representative of a western race. The specimen collected by Professor Morse, on the other hand, visited a feeding station and was distinguished in the field before it was taken "in the cause of science." However, anyone who hopes to identify one of these races in the field should first read what is written above about our New England specimens. He who will read the descriptions of all the various races of juncos, examine the specimens on which they are based, and review the changes and counter-changes that experts have made among the various forms, will be likely to doubt sight records of any of the many closely related forms of this genus.

Melospíza melódia melodia (Wilson). Song Sparrow.

Other names: GROUND-BIRD; GROUND-SPARROW.

Plate 72.

Description. — Bill conic, of medium size; wings short and rounded, first primary shorter than sixth; tail rather long, usually equalling or exceeding length of wing and rounded, the feathers broad to their rounded ends; legs and feet moderately stout; no yellow anywhere. *Adults (sexes alike)*: Above generally with a striped mottled brown effect as in most sparrows; top of head brown, finely streaked with black or blackish, divided in the center by an inconspicuous grayish line or stripe and bounded on either side by a broad stripe of same over each eye; hind neck brownish-gray, streaked or washed brown, sometimes mostly brown; back and scapulars brown, streaked black or brownish-black, with some gray feather-edges; rump olive-gray or brownish, streaked slightly with brown; upper tail-coverts similar but browner, each feather centrally blackish; tail brown or grayish-brown, its feather-edges brownish-gray, darker shaft-lines on middle feathers, these often with obsolete wavy barring; flight-feathers chiefly dusky, tertials largely blackish, all with most of outer webs brown; edge of wing around bend white; wing-coverts have blackish centers and brown edges and tips; tips of greater coverts lighter or whitish, but not forming conspicuous wing-bars; sides of head pale grayish or pale buffy or both, marked with three blackish stripes, one behind eye, another at lower edge of ear-coverts, and another running from



Song Sparrow, Juvenile.

PLATE 72

PLATE 72

FOX SPARROW
Page 104

SONG SPARROW
Page 92

LINCOLN'S SPARROW
Page 98

SWAMP SPARROW
Page 101

ADULT

IMMATURE

base of lower mandible down lower side of lower jaw; sides of neck grayish, streaked brown; below white or whitish, distinctly streaked dark brown or blackish on breast, sides, flanks and under tail-coverts, the streaks often more or less edged with rusty-brown, usually forming a cluster or large spot in center of breast (this spot not always present or visible); *chin and upper throat usually unmarked* (markings sharp in late summer, but more suffused after postnuptial molt); bill pale brown to dusky or blackish above, lightening toward base below; iris brown; legs and feet light brown; "bill in both sexes horn-color" (Wilson). *Young in first winter plumage:* Similar to adults, but with markings more suffused, grayer ones more dusky and sides and breast tinged with "yellowish-rufous" or buffy. *Young in juvenal plumage:* Similar above to young in first winter plumage, but no trace of grayish anywhere; streaks below narrower and more yellowish, no large distinct spot on breast as in adults, bill and feet lighter in color; "feet and bill pinkish-flesh, becoming dusky with age, the lower mandible remaining partly flesh-color" (J. Dwight).

Measurements. — Length 5.90 to 6.80 in.; spread 8.25 to 9.25; folded wing 2.35 to 2.80; tail 2.58 to 3.02; bill .47 to .55; tarsus .80 to .90. Weight, male about .88 oz. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August to November), may be complete in some cases; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (August to October); adults have complete postnuptial molt and acquire breeding plumage by wear.

Field Marks. — Size of Junco; an active ground bird seen much about bushes and fences; brown above, back darkly streaked; top of head brown with inconspicuous central light stripe and two broad light ones on each side above eye; white below with large dark spot on streaked breast; no yellow about head; tail rather long and *rounded*. Young have a buffy band across breast narrowly streaked dusky; difficult to distinguish in field from young Lincoln's Sparrow or Swamp Sparrow, but lighter above than young Swamp Sparrow, especially on top of head.

Voice. — Alarm note a *tchenk*, also commonly a *sst* (R. Hoffmann); song variable but always of the same quality and general nature; the words used to express its rhythm by old-time country people, as given by H. D. Thoreau are "Maids! maids! maids! hang up your teakettle-ettle-ettle," and these words give some idea of the swing and tempo of the song; the first three notes brisk, but rather long, the last few run quickly to the end; in late summer and autumn a lower, warbled song, quite different from the sprightly spring music.

Breeding. — Usually on moist land near some swamp, spring, brook or ditch where water is at hand, or near the margin of pond, lake or river, where thickets are near. *Nest:* Built commonly on ground, usually well concealed under grass-tuft, bush or brush heap, or in bushes, or less commonly in trees; more rarely in hollow logs, hollow trees, nesting boxes, or even in unoccupied buildings; composed chiefly of grasses, weeds, bark, leaves, etc., and lined with finer material, sometimes with rootlets or hair. *Eggs:* 3 to 7; .75 to .94 by .55 to .65 in.; from short ovate to long ovate; very variable, light greenish-gray, greenish-white, pinkish-white, bluish-white, etc., sprinkled with fine dots of light or dark reddish-brown over whole surface, often also with blotches of darker brown concentrated somewhat near large end, often with spots of lilac; figured by E. A. Capen in "Oölogy of New England," Plate IX, Figs. 10–13. *Dates:* May 24 to August 20, Connecticut; April 30 to July 29, Massachusetts; May 20 to July 27, Maine. *Incubation:* Period 10 to 14 days; by both sexes, female chiefly. Two or three broods yearly, even four in the middle states, and possibly sometimes in southern New England.

Range. — North America east of the Great Plains. Breeds chiefly in Canadian, Transition and Upper Austral zones, from southwestern Mackenzie, central Manitoba, northern Ontario, south-central Quebec and New Brunswick south to central Alberta, south-central Manitoba, Wisconsin, Iowa, south-central Missouri, Kentucky, eastern Tennessee, western North Carolina and southern Virginia; winters from southern Wisconsin, southern Michigan, southern Ontario, southern Quebec and New Brunswick to southern Texas, Louisiana, southern Alabama and southeastern Florida.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common to abundant

migrant and summer resident; rare local winter resident in southern parts, chiefly coastwise or in valleys. *Massachusetts, Rhode Island and Connecticut:* Common to abundant migrant and summer resident; uncommon local winter resident, mostly coastwise or in valleys.

Season in Massachusetts. — Resident. Spring migrants appear in late February or March. Fall migration begins in late August and continues through November.

Haunts and Habits. Song Sparrow! Well named! This is the modest, lowly avian minstrel of the briar-patch — the most persistent singer of them all. He sings day after day; awake or dreaming, he sings in the darkness of night; and, north or south, he sings every month in the year. When the mercury drops below the zero mark or when it approaches 90 degrees, still the song of "Silver-tongue" may be heard at times, ringing, sweet and clear. He is an unquenchable optimist. Nothing seems to discourage or daunt him.

"Winter has scarcely begun to relax his icy grasp from the water and to lift his snowy mantle from off the land," writes Mr. Charles J. Maynard, "when those harbingers of the coming spring, the Song Sparrows, begin to chant their enlivening lay about the homesteads of New England. Loud and cheerily do they sing on the brightest mornings in early March, and when they have once begun nothing seems to daunt their ardor. No matter how very stormy the weather, daylight always finds them singing. I have heard their song when the wind was blowing a gale, and the little performers were obliged to seek shelter beneath the hedges, and have seen one start to fly when the force of the blast was so great that it fairly swept him into a thicket, where he clung tenaciously to the boughs and, as if to bid defiance to the raging elements, poured forth his liveliest carol. Rightly has this species been named *melodia,* for none among our native birds sings so long or so often as the Song Sparrow." [1]

During the morning chorus of bird song it often sings from six to eight times a minute. A lady who is accustomed to rise in the night and turn on the lights says that when this occurs, a Song Sparrow that nests near-by always begins to sing. Song Sparrows seem fond of music and some show their excitement by singing when a piano is played within hearing.

Our bird likes a well-watered, fertile country where thickets abound. He is normally a lowlander, but will nest in a mountain pasture if there is a "living spring" near-by with its flowing rill. It is now generally believed that birds have descended from reptilian forms of life. If so, the Song Sparrow may well have come from amphibian ancestors, as no land bird seems more fond of water. Where no other form of bath offers he bathes in wet leaves or wet grass after a night shower, and where there is water in plenty he takes a cold bath every night after sunset, until the water freezes, and he bathes during the day whenever opportunity offers; sometimes on sunny days he lies down after a bath and spreads himself out to dry in the sun. If on the seashore, a salt water pool does very well for his bath tub. It is interesting to see one after a hard shower striking the twigs with his wings and thus throwing the water over his plumage.

[1] Maynard, C. J.: Birds of Eastern North America, 1881, p. 116.

The Song Sparrow is fond of the home garden, and often nests in the berry patch or in the back yard shrubbery, and sometimes even in climbing vines on porch or veranda. A nest was found on the top of a post in a grape arbor sheltered by the vines; another in a woodshed in a sheltered nook beside the door. The nest rested on a scantling and the birds found access to it through a hole in the boarding. Another was built in a hollow fence rail.

When once this sparrow has chosen a home, nothing but death will keep it from the beloved spot. It dodges the dogs and cats, and can hardly be driven away. Once an inexperienced pair built a nest on the ground at the foot of a high tree in my garden. As is so common in such cases a cat got the young. Then the birds built again in a bush; again the stealthy cat! Twice bereaved, the mated pair grieved for a while and then fashioned a third domicile about twenty feet up in an elm tree among dense "suckers," where they escaped the notice of their feline enemy and reared their young in triumph.

Song Sparrows soon learn to know their friends, and where humane people feed them, they may be taught to come for their food when called. Mrs. Daniel Vincent, of Chilmark, Massachusetts, tells of a relative who was accustomed to feed with crumbs the trout in a brook, and tried to teach them to come at the sound of a bell. A Song Sparrow which had a nest in a bush near the feeding place, soon learned to come whenever the bell rang, to pick up crumbs thrown on the grass for her.

Mr. G. W. Quincy tells me of a bird of this species that learned to come to a window and tap on it when hungry. Whenever he tapped the inmates threw out seeds for him.

The Song Sparrow is known by the large spot in the middle of the striped breast, but several other sparrows show a somewhat similar spot. That on the Song Sparrow is merely a cluster of spots which does not appear in the juvenal bird, and may be absent at times in the adults. I have seen it appear and disappear from time to time as the bird moved about. It is merely an arrangement of spotted feathers.

The Song Sparrow was one of my earliest bird acquaintances, and the very first on which, at the age of thirteen, I began my self-education in the gentle art of taxidermy. Daily after school for several days I labored on that mishandled bunch of feathers in an attempt to impart to it a lifelike appearance. That first "stuffed bird" stood for many a year in my collection, a cherished specimen. In memory I can see it now. It had much the appearance of many old museum birds of that period which, as Charles Waterton puts it, were "stretched, stuffed, stiffened and wired by the hand of some common clown." Since that day I have always had a peculiar affection for the Song Sparrow, and must admit that as its historian I am prejudiced in its favor.

Song Sparrows are early comers. In mild seasons a few begin to work northward in extreme southern New England about the middle of February, but it is not until some bright morning in late March that the erstwhile lifeless icebound swamp becomes resonant with their cheerful songs. In the thickets along the edges they fly back and forth singing and playing about as if spring were really here. Their early arrival, however, does not

indicate very early nesting, though I remember one nest on a ditch bank, when the ground was covered with two or three inches of new-fallen snow, and when the bird left the nest at my close approach it was revealed as a little dark hole with its complement of four brown-spotted eggs framed by the white blanket of snow.

Song Sparrows spend much time in the pleasant pastime of courtship. The females seem to be modest and coy. There is considerable rivalry among the males, but their contests appear to be mainly competitions in song and flight. They chase the females and each other about through the air with fluttering wings, often sailing and singing. Their pursuit seems not to be in earnest, as, notwithstanding the rapid movement of their wings, their progress is slow. Now and then a bird pauses in his flight to sing, supported for an instant on his widespread pinions. Flight-songs also carry them up into the air. Occasionally a battle ensues between two rival males, and sometimes they even roll and tumble in the dust with locked bills and beating wings.

When the pair have mated, nest building requires from five to ten days according to the weather and the industry of the birds. The male devotes himself more to song than to labor. Some males assist the female a little in incubation. Mrs. Elizabeth Burbank tells of a pair, one of which relieved the other on the nest at twelve o'clock noon; the returning bird (probably the female) turned the eggs before settling down on them. The male stands guard much of the time until the young are hatched, when he takes over his full share of the work of defending, brooding and feeding them. The young remain in the nest from seven to fourteen days, depending on the quantity of nourishment they receive and whether they are disturbed. Like the young of all ground birds they develop quickly, when well fed, and can live in the grass before they are able to fly.

Song Sparrows are brave little birds and are very devoted to their young. Should such an enemy as a snake or a turtle appear near the nest, the adults take their stand bravely before it in a position of defence, with outspread wings and depressed tails, guarding their offspring. If this bold and defiant front is not effective they may even attack the enemy, though with little hope of success. They often attack birds as large as the Hairy Woodpecker and the Catbird, when such approach the nest. One Song Sparrow was seen to drive five "English" Sparrows away from a feeding station.

The usual number of eggs in a Song Sparrow's nest is from three to five, but rarely six or even seven may be found. Mr. Arthur Harrison sent me a photograph of a nest containing nine eggs, with the following explanation: He found two Song Sparrows building their nests about thirty feet apart on the bank of the Merrimack River, one about six feet above the ordinary summer level of the water, the other about twelve feet above it. After the nests were built he watched them and found that both females were laying in the upper nest, while the lower was deserted. Apparently the two birds took turns in incubating the eggs, as when the nest was approached time after time, the bird on the nest acted differently at one visit from the one occupying the nest at the next examination. When the young were hatching there came a deluge of rain, raising the river until the lower nest was submerged. Had there been young in it they would have been drowned.

As it was, the four birds continued to feed the young in the upper nest and they brought off safely eight young from the nine eggs.

When the young of the first brood are able to fly, the female immediately begins to deposit eggs for the second brood, often in the same nest, leaving the male to care for the first, and he attends them usually until the young of the second brood have hatched, when he leaves them to help feed and care for the younger brood. In this way four broods are sometimes hatched in a season. But it is seldom indeed that all get away safely. If there is a brush pile near-by the male is likely to lead the young ones to it as a safe place of refuge, where he feeds them.

A few Song Sparrows begin moving away from their breeding places in Massachusetts about the middle of July. Though some may remain until November, most of them have gone by the first of October. Some at least of the New England birds pass southward along the Atlantic seaboard, as one banded by Mr. Wendell P. Smith, in the Connecticut Valley at Wells River, Vermont, on October 13, 1925, was taken at Wadesboro, North Carolina, March 2, 1927, by Mr. J. P. Williamson.

Song Sparrows sing more or less in autumn. Even while molting an occasional whisper song may be heard. There is more singing on warm days in October, however, than in September, and although at times the full loud spring song may be heard, most of the singing is quite different, ranging from a low connected warble to a song resembling that of the Purple Finch, and (rarely) one like that of the Vesper Sparrow. There is a particularly low, sweet, melancholy warble uttered just before the bird departs for the south. Most of the hardy Song Sparrows that winter in New England probably come to us from the northland and for the most part they pass the winter near the sea, where the ground is clear of snow in patches for a large part of the winter. A few winter in the interior, some of them well up the valleys of the Connecticut and Merrimack Rivers. In severe winters, however, numbers succumb to cold and starvation. Mr. Wilbur M. Smith, of South Norwalk, Connecticut, told me that in the winter of 1920 Mr. Burgess Jennings saw one fall off a branch in his yard, picked it up and carried it into a warm room, where it finally recovered, and when released flew away. Other similar cases have been reported, but the bird does not always recover.

Dr. S. D. Judd gives quite a full exposition of the Song Sparrow's food, and separates the different components into their percentages. But little space can be devoted to a summary here. Vegetal matter (chiefly weed seeds) forms 66 per cent of its food for the year, while animal food (mainly insects) forms 34 per cent. The insects taken are similar to those taken by the Chipping Sparrow and the Field Sparrow, and include such pests as cut-worms, gipsy-moth caterpillars, canker-worms, army-worms, cabbage-worms, locusts, grasshoppers, crickets, weevils etc.[1]

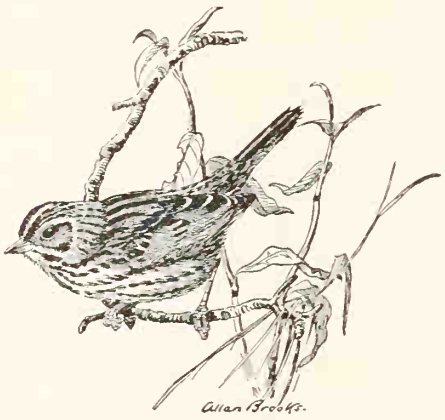
Economic Status. The only harm done by this bird consists in a small amount of grain and small fruits taken by it occasionally. Dr. Judd considers that it does "much more good than harm."

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 82–86.

Melospiza lincolni lincolni (Audubon). Lincoln's Sparrow.

Plate 72.

Description. — Formed much like Song Sparrow, but smaller, tail shorter, and less heavily streaked on sides of head and below; 1st primary longer than 6th; tail-feathers narrow but not pointed. *Adults (sexes alike)*: Top of head rather light brown, conspicuously streaked black and divided by a center stripe of grayish; sides of head olive-gray, streaked blackish behind eye, also on ear-coverts, thus leaving wide stripe of this color above eye; the olive-gray extends down on sides of neck; side of lower jaw usually buffy, a streak both above and below blackish; narrow eye-ring buffy-whitish; hind neck, back, scapulars, rump and upper tail-coverts light grayish-olive to buffy-olive or grayish-brown, streaked black, broadest streaks on back; outer surface of closed wing mainly rusty-brown on exposed surfaces, but black feather-centers show on wing-coverts and especially on tertials; tail light brown with lighter feather-edges and central pair or more with dusky shaft-streaks; below white, washed across upper breast usually, but not always, and on sides, flanks and under tail-coverts with buff or brownish-yellow; buffy parts narrowly spotted and streaked black; some individuals, when alive, show, like Song Sparrow, a dark spot or cluster of spots on the upper breast, but this like other marks below is smaller and less distinct than in Song Sparrow; wing linings paler than sides; bill dusky above, bluish below, growing yellowish toward base; iris brown; legs and feet light yellowish-brown. *Young in first winter plumage:* Virtually indistinguishable from adults, but colors not quite so bright, or more buffy and more suffused and markings not so well defined. *Young in juvenal plumage:* Resembling juvenal Song Sparrow, which usually has no cluster of spots on upper breast, but wings and tail a trifle darker, especially feather-edges; top of head also darker; chin streaked; some closely resemble juvenal Swamp Sparrow; "bill and feet pinkish-buff . . . upper mandible slaty" (J. Dwight).



Lincoln's Sparrow, Juvenile.

Measurements. — Length 5.25 to 6.00 in.; spread 7.10 to 8.75; folded wing 2.30 to 2.65; tail 2.11 to 3.00; bill .38 to .46; tarsus .75 to .78. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August) involving body plumage and wing-coverts; first breeding plumage by wear; adult winter plumage by complete postnuptial molt, beginning in August; adults have but one molt annually, postnuptial (August).

Field Marks. — *Adults:* Somewhat smaller than Song Sparrow, slimmer and neater in appearance; tail shorter; more narrowly streaked below; sides and flanks brownish-yellow or buffy, and usually a *band of same across upper breast*, distinguishing it from all our sparrows except juvenal Song Sparrow and young Swamp Sparrow. *Young:* Often indistinguishable in the field from young Song Sparrow, unless by narrowness of dark streaks on either side of throat.

Voice. — Alarm note a slight *tsup* (R. Hoffmann); a junco-like *chŭp* (Wm. Brewster); *qsup* (A. C. Bagg); call a thin shrill *cheak* (O. W. Knight); a sharp *chip* and a low *tzz* similar to note of Song Sparrow (G. M. Allen); also a *smack*, probably an alarm note (Townsend and Allen); song fine, sweet, melodious and somewhat wren-like; quality also sometimes resembles that of Purple Finch; "song may be written QUEE, QUEE, QUEE (nasal and comparatively loud), *see, ceeee*, EEDLE or SEE-*dle*, SEE-*dle*, SEE-*dle*, SEE-*dle*, *see-sec-see, seec, cedlc* or *cke*, a loud and rather guttural strain at the start but becoming very soft, although

at the very end the soft *sees* change abruptly at the last note or two to the same harshness and loudness that characterize the beginning of the song" (J. A. Farley).

BREEDING. — In or near bushy swamps or on swampy or wet land. *Nest:* In a tuft of grass, and usually surrounded by water; composed of grass and lined with finer grass. *Eggs:* 4 or 5; like those of Song Sparrow, but average smaller; .72 to .80 by .55 to .60 in.; rounded ovate; white, greenish-white or pale green, sometimes speckled and spotted so heavily with browns as to almost conceal ground color. *Dates:* June 10, northern New York; June 6, northern Wisconsin.

RANGE. — North America. Breeds in Hudsonian and Canadian zones from north-central Alaska, central Yukon, central-western Mackenzie, northern Saskatchewan, northern Manitoba, northern Ontario and northern Ungava (Quebec) south in the Cascade, Sierra Nevada and Rocky mountains to southern California, central Arizona, northern New Mexico, and at lower elevations to southern Alberta, central Saskatchewan, central Manitoba, northern Wisconsin, northern Michigan, northern Illinois (casually), south-central Ontario, northern New York, northern Maine, New Brunswick and Nova Scotia; winters from central California, southern Arizona (probably), northern Oklahoma, central Arkansas, northern Mississippi and northern Georgia to Guadalupe Island (Lower California), Guerrero (southern Mexico), central Guatemala and British Honduras; rare or casual east of the Alleghany Mountains and south of the District of Columbia; casual in Panama.

DISTRIBUTION IN NEW ENGLAND. — Rare spring and uncommon fall migrant; rare summer resident in parts of northern and eastern Maine.

SEASON IN MASSACHUSETTS. — May 7 to June 1; August 30 to October 14 (November 1).

HAUNTS AND HABITS. What has a bird, as inconspicuous as Lincoln's Sparrow, done that it must hide itself so assiduously from human eyes? It seems to dread discovery, else why should it steal so cautiously through the depths of leafy thickets, or sneak so silently along bushy stone fences. Even when singing it seems careful to keep out of sight. At least that is its usual behavior when only one or two are seen, but when half a dozen are together and singing they are not quite so cautious and may be approached with less difficulty.

In New England this sparrow is a bird of the thicket, and in migration may be found in bushy places along low river shores or in other moist lands, along bushy fences, walls and roadsides, in rocky pastures where white pines or red cedars grow, or even on dry hillsides where its favorite thickets stand. Now and then one or two enter a village or suburban garden or back yard, and tarry for a time among the syringa or lilac bushes. The general belief that the bird is exceedingly rare along the Atlantic seaboard is not well founded. It is a regular, though not common, migrant there in spring and fall, but it is overlooked because of its retiring nature, the uncertain light in most of its shadowy retreats, and the rapidity of its passage. In spring most members of the species usually pass along within a week or ten days. In autumn their stay in southern New England is longer, but then they are more silent and shy. When seen they often are mistaken for Song Sparrows, as their differently colored breasts are seldom seen, and even in autumn they resemble some young Song Sparrows.

Mr. Ludlow Griscom writes as follows of Lincoln's Sparrow in the region about New York City: "While uncommon it is a regular transient in our area, but will never be seen, except by a lucky 'fluke,' unless specially looked for. In spring it is particularly fond of water courses, the banks of which are grown with bushes, where it remains down

among the roots and disappears at the slightest noise. By going as rapidly and noisily as possible through such a tract, a *trim, small, grayish-brown* Song Sparrow will sometimes flash into view for a second, as it dives headlong into the bushes a few feet ahead. Making every possible effort to be quiet, the student should next make a wide detour and return to the bank *ahead* of where the bird was seen to enter. In this way I have had the bird come to me within six feet. If a confederate be available, and the bird can be put in between the observers, one or both can obtain an observation. Lincoln's Sparrow will occur, however, in dense shrubbery almost everywhere, and I see it every spring in Central Park. It is exceptional to see more than one or two a season, and then it will occur on the big waves only." [1]

My own experience agrees with the above, and like Mr. Griscom I have found the species by itself in spring, though it may be found in company with Song Sparrows and other sparrows in autumn. If one can paddle quietly or drift with the current along a bushy river shore during a bird wave in mid-May, he may hear the song, or the bird's curiosity may cause it to expose itself. Once I saw several in this manner, two of them singing from the tops of bushes, and in plain sight. I have characterized the song above as somewhat wren-like, also having a quality resembling that of the Purple Finch, but since writing that I have found a better description by Dr. Jonathan Dwight. He says: "It is not loud and suggests the bubbling guttural notes of the House Wren combined with the sweet rippling music of the Purple Finch, and when you think the song is done, there is an unexpected aftermath." Usually an approach to a singing bird must be absolutely noiseless, or he will stop singing, but by going *carefully* I have been able to hear the song many times during spring migrations in Massachusetts. The bird creeps in and out about walls, fences and wood-piles, much like a wren, and sings usually, but not always, from the top of a bush. I have heard the song when the bird was concealed among bushes and close to the ground.

There is every reason to believe that Lincoln's Sparrow breeds in northern New England. Pairs have been seen in several localities in Maine during the breeding season. In "The Birds of Maine," Professor O. W. Knight speaks of a few seen at Fort Kent early in July, 1904, and Mr. F. M. Kilburn, writing to me from Machias, says that a pair remained near the State Normal School in 1920, but they were very shy, "haunting alder thickets in pastures and swales" and that he was unable to find the nest, though the male was in full song. Writing on June 26 he says, — "I have heard or seen several Lincoln's Sparrows during the month, this morning I heard a male in full song less than a quarter of a mile from the School." On January 27, 1926, he wrote again that after seven years of observation it was his opinion that the bird should now be considered a fairly common summer resident of Washington County, Maine, and that each year there had been one or two pairs breeding in a boggy pasture near the State Normal School. He had observed in some of the larger bogs or heaths as many as ten pairs in the breeding season, had seen them carrying nesting material in June, and food in July, but they were so secretive that

[1] Griscom, Ludlow: Birds of the New York City Region, 1923, p. 284.

he had not been able to find even one of their nests. Mrs. Wm. H. Gardner, writing from Bucksport, Maine, says that in August, 1920, she saw an adult feeding a young bird so small that it must have been just from the nest. This species should be looked for in summer among the mountains of northern New Hampshire and Maine, as it breeds in mountainous regions of the West and in the Adirondacks in New York.

In the fall migration Lincoln's Sparrow appears most commonly in Massachusetts during the latter half of September. It may be found there occasionally with other sparrows in weedy gardens and potato patches or among the tall grass and bushy thickets bordering some swamp, lake or stream. It is a neat, rather slim bird of furtive mien and uneasy movement, grayer above than the Song Sparrow, but in spite of its shyness, rather inquisitive. Because of its curiosity it sometimes will come out in the open, if the observer can keep fairly well concealed. The food of this sparrow, as far as it is known, is similar to that of the Song Sparrow.

Economic Status. Although apparently a useful species, Lincoln's Sparrow is not common enough in New England to have much economic importance here.

Melospiza georgiána (Latham). Swamp Sparrow.

Plate 72.

Description. — Somewhat similar to Lincoln's Sparrow in shape and proportions, but more robust, darker and *1st primary shorter than 6th* c. 7th. *Adults (sexes alike)*: Forehead black divided by a central line of grayish; top of head chestnut often streaked blackish; back and scapulars rather light reddish-brown heavily streaked black; rump olive-brown, passing into plain brown or rusty-brown on upper tail-coverts, where streaked black; tail rusty-brown, outer webs brightest, two middle feathers with black or blackish shaft-streaks; exposed surface of closed wing chiefly chestnut, coverts showing some of their black central parts, and a light line along tips of greater coverts forming an inconspicuous narrow wing-bar; black ends of tertials and primaries conspicuous; tertials bordered white or whitish on outer end margins; sides of head and sides of neck chiefly gray, paler or whitish below and before eye, which has a narrow white eye-ring; ear region brownish-gray or more brownish, margined above by a dark stripe leading back from eye, and below by a narrower dark streak from gape; another narrow dark streak or line (not always present) runs from base of lower mandible down lower side of jaw, as in several other sparrows; chin, throat and abdomen white or grayish-white; some birds have chin and throat sparsely spotted with black; upper breast gray, sometimes indistinctly streaked darker; sides and flanks tawny-brown, sometimes also streaked darker; wing linings mostly whitish, outer edge of wing white or whitish; bill above dark brown or dusky, edges and below pale brown to pale bluish; iris brown or hazel; legs and feet flesh-color to light brownish. In autumn there may be an indistinct central streak along top of head, and sides and flanks may be brown. *Young in first winter plumage:* Similar to adult in winter, and not always distinguishable, but usually chestnut on top of head not so bright, gray on sides of head and neck lighter or more brownish, and chin with some tinge of yellowish, and often with indistinct stripes below. *Young in juvenal plumage:* Similar to young Song Sparrow (see page 93) but darker especially on top of head, more buffy and more narrowly and darkly streaked below.

Note. There is much variation in the juvenal plumage of many birds, and in some species there seems to be considerable variation in the first winter plumage. Dr. E. G. Rowland informed me that he had banded a number of Swamp Sparrows that showed a yellow spot in front of the eye on the lores. He believed that some of these birds were adults, and some young in first winter plumage, but as it is difficult

or impossible in many cases to distinguish between adult winter and first winter plumage, all probably were young birds. Five of his birds, he said, had a very pronounced yellow spot and two a yellow line over the eye besides, and wherever yellow on the head was noticeable the edge of the bend of the wing and the markings of the axillars were yellow also, "the yellow varying from pale sulphur to dull chrome." One also had a wash of sulphur-yellow across breast and chin. These birds were all taken after September 23, when they would naturally be in winter plumage. Three of his birds had a very narrow black edging around the white throat.

In "A History of North American Birds," by Baird, Brewer and Ridgway, there appears a colored representation of the head of a sparrow with some yellow in front of the eye and on the throat.* This head is labelled *Passerculus caboti*, but has no accompanying description. Dr. Elliott Coues examined the type specimen from which, presumably, this drawing was made and pronounced it a young Swamp Sparrow.[1] In 1885 Mr. R. H. Bulley of Canton, Ohio, took a female Swamp Sparrow without any of the bright chestnut of the adult on the crown and with a pale but distinct lemon-yellow line above the eye and some yellowish-brown on the throat, which he referred to Dr. Coues. It was another so-called *Passerculus caboti*, — merely a rather unusual plumage of the Swamp Sparrow or a variation of it.[2] There is a specimen in the Museum of Comparative Zoölogy, at Cambridge, Massachusetts, taken by Mr. W. E. D. Scott, January 13, 1892, at Tarpon Springs, Florida, which seems fairly typical of this phase. It is a young bird, apparently in first winter plumage. Dr. Edward G. Rowland has published a part of his experience.[3] He tells me that Mr. S. G. Emilio, of Danvers, Massachusetts, has brought to his attention a method of distinguishing young Swamp Sparrows from young Song Sparrows. In all young Swamp Sparrows the inside of the mouth, especially the upper part, is predominantly yellow, while in Song Sparrows the same area is pink or gray.

Measurements. — Length 4.80 to 5.80 in.; spread 7.50 to 8.00; wing 2.25 to 2.57; tail 2.45 to 2.90; bill .45 to .47; tarsus .80 to .88. Female smaller than male.

Molts. — Similar to those of Chipping Sparrow (see page), but some birds may require another season to assume highest adult plumage; the head molt in spring occurs in March and early April.

Field Marks. — Size smaller than Song Sparrow, tail shorter, less rounded. *Adults:* A dark sparrow with chestnut cap, grayish sides of head and breast, and a white throat like that of White-throated Sparrow but smaller, and much less conspicuous; no conspicuous wing-bar; known from Chipping Sparrow by more robust build, larger head not conspicuously striped, and tail not forked but rounded, and from Song Sparrow by *unstreaked (or very faintly streaked) breast. Young:* Known in first winter plumage by close resemblance to parents, though often less bright and more brownish or buffy; in juvenal plumage much like young Song Sparrow or Lincoln's Sparrow, usually darker, but rather difficult to distinguish from them in the field.

Voice. — Call note a *chink*, *chip* or *cheep*, with a metallic ring; song *weet-weet-weet-weet-weet*, etc., a little like that of Chipping Sparrow, but less dry, louder, a trifle more musical and more varied; also a limited variety of twittering notes.

Breeding. — In wet meadows, bogs, swamps and marshes or about low swampy shores of lakes and streams. *Nest:* Usually in a tussock or very low in bush; some have grasses or sedges arched over them, others do not; composed of grasses, etc. *Eggs:* 4 or 5; † like those of Song Sparrow and indistinguishable from them in color, being quite as variable in coloration, but averaging smaller; about .75 to .85 by .55 to .60 in.; figured by E. A. Capen in "Oölogy of New England," Plate IX, Figs. 7–9. *Dates:* May 25 to June 7, Virginia; May 24 to 31, Rhode Island; May 13 to July 14, Massachusetts; May 31 to June 3,

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* Land Birds, Vol. II, Plate XLVI, Fig. 9.

[1] Bulletin, Nuttall Ornithological Club, Vol. VIII, 1883, p. 58.

[2] Auk, Vol. III, 1886, p. 277.

[3] Bulletin, Northeastern Bird-Banding Association, Vol. I, 1925, pp. 40–42, also Vol. IV, 1928, pp. 53–56.

† Mr. Henry W. Abbott informs me that he once saw a nest of a Swamp Sparrow with 8 eggs, two however had been pushed out of the nest.

Maine. *Incubation:* Period 12 to 15 days (O. W. Knight); probably by female only. One or two broods yearly.

Range. — Eastern North America north to borders of Hudsonian Zone and west to the Great Plains. Breeds in Canadian, Transition and Upper Austral zones from central-western Mackenzie, northern Saskatchewan, northern Manitoba, northern Ontario, central Quebec and Newfoundland south to central Alberta, central Saskatchewan, southeastern Nebraska, central Missouri, central Illinois, northern Indiana, central Ohio, southern Pennsylvania, mountains of southern West Virginia, central New Jersey, southeastern New York (Long Island) and southern Connecticut; winters from eastern Kansas, northern Missouri, southern Illinois, southern Indiana, central New York and Massachusetts south to southern Tamaulipas and Jalisco (Mexico) and the Gulf coast from southern Texas to southeastern Florida; very rare or casual in Montana, Utah, Colorado and Bermuda Islands; accidental in British Columbia and California.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common migrant and uncommon to common local summer resident. *Massachusetts, Rhode Island and Connecticut:* Common migrant; less common and more local summer resident; rare winter resident, chiefly coastwise.

Season in Massachusetts. — March 13 to November 30 (winter).

Haunts and Habits. The Swamp Sparrow is not a public character. He will never be popular or notorious. He is too retiring to be much in the public eye, and too fond of the impassable bog and morass to have much human company; and so he comes and goes unheralded and to most people unknown. He is the dark little bird that fusses about in the mud when spring floods have overflowed the wood roads, or slips through the grasses on marsh-lined shores of slow-flowing, muddy rivers. Any watery, muddy, bushy, grassy place where rank marsh grasses, sedges and reeds grow — any such bog or slough where a man will need long rubber boots to get about — is good enough for Swamp Sparrows. In such places they build their nests. But in migration they may appear almost anywhere, though seldom distinctly seen and recognized by ordinary observers, because of their retiring habits. When they are looked for, they sneak about, mostly under cover, and hardly show themselves sufficiently for identification, but if the observer apparently takes no interest in their whereabouts and sits quietly down, curiosity may overcome their suspicions and bring them into view.

In the autumn migration many of these birds visit weedy gardens and fields with other sparrows, for they are great eaters of weed seeds. Their nesting habits are difficult to observe, but the male's song during the nesting season will give some idea of the location of the nest. Mr. William C. Wheeler, who watched a singing male for about an hour, found that a few times during the hour he sang two different songs alternately. First he sang one several times, and then did the same with the other.

The young ordinarily remain in the nest about 12 or 13 days, if undisturbed. Swamp Sparrows nest near water so frequently that the callow young in their first attempts at flight are likely to fall into it and struggling as they do on the surface, they sometimes fall a prey to large frogs, fish or turtles. The following from one of my note books shows how one little bird bravely struggled to safety: "Concord, August 28, 1907. This morning early as I stood on the river bank, a bird flying toward me fell and struck the water about half way across the stream. Immediately it fluttered swiftly along on the

calm surface of the water for about a rod, and then, apparently exhausted and unable to raise itself from the water, it lay there for a few seconds, head under and tail a little raised. I looked to see some fish seize it, but no! Suddenly by a vigorous struggle it raised its body clear of the water and fluttered almost ashore, alighting on the pickerel weed at the water's edge. A few minutes later, having regained its breath and courage, it flew up into the bushes, and I saw that it was one of a brood of young Swamp Sparrows in juvenal plumage, which were flitting along the shore."

The food of the Swamp Sparrow consists largely of insects and the seeds of weeds, as in the case of the Song Sparrow, but more aquatic insects are eaten.

Economic Status. The value of the Swamp Sparrow as an insect eater consists mainly in the control it exercises over the increase of such marsh insects as the army-worm. When these latter insects increase unduly in the lowlands, their natural habitat, they overflow into the uplands and destroy grass and cultivated plants. The bird is not as important as the Song Sparrow, as it feeds much less about cultivated land.

Passerélla ilíaca iliaca (Merrem). Fox Sparrow.

Other name: fox-colored sparrow.

Plate 72.

Description. — A large, rather robust sparrow; bill conic, its outlines nearly straight; wings long and pointed, when folded reach near middle of tail, which is not long, and is nearly square; feet and claws very large and strong. *Adults (sexes alike)*: Above, nearly uniform chestnut, reddish-chestnut or rusty-red, brightest on wings, upper tail-coverts and tail, often more or less spotted and streaked elsewhere above with same color on a grayish or ashy background, but very variable, some birds are largely olive-gray above streaked with chestnut or rusty-red; tips of middle and greater wing-coverts lighter, forming two rather inconspicuous narrow wing-bars; below, white with broad spots and streaks of chestnut, especially on upper breast (where they form a cluster), sides and flanks; bill brownish or dusky above, edges and below yellow or straw-color; iris brown; legs and feet flesh-color to clay-color. *Young in first winter plumage:* Like adults, but primary-coverts browner. *Young in juvenal plumage:* Similar to young in first winter plumage, but color above more uniform reddish-brown, not so pure white below, and texture of plumage looser.

Measurements. — Length 6.75 to 7.50 in.; spread 10.50 to 11.75; folded wing 3.30 to 3.80; tail 2.70 to 3.17; bill .45 to .55; tarsus .96 to 1.04. Weight 1.50 oz. (B. H. Warren). Female smaller than male.

Molts. — Similar to those of Lincoln's Sparrow (see page 98).

Field Marks. — Size larger than Bluebird; large size and bright reddish-brown color distinguish it from other sparrows, especially its *broad, bright reddish-brown tail;* might be taken for Hermit Thrush by casual observers, especially when viewed from behind, for that thrush has a somewhat similarly colored tail; however the thrush's bill is not conic, but longer and more slim, and it has no foxy color about head; also spots on its white breast are smaller, darker, and less reddish than in Fox Sparrow.

Voice. — Alarm note a loud *smack*, richer than that of Junco, more like that of Brown Thrasher; call note, a long drawn *stssp* (commonly heard in Massachusetts) and a short *chip;* song, clear, full, flute-like; that on breeding grounds written down (but inadequately) as *cher-ee, hear-her, hear-her, tellit,* or *to-whip, to-whee, oh-whee buzz tellit,* last note short, faint, main stress on second and third bars (Town-

send and Allen); song in Massachusetts, *tou-la tou-la tou-lit* (Miss Agnes M. Learned). Some believe the song unequalled by any native member of the sparrow family.

Breeding. — In or near northern coniferous forests, or in alder thickets. *Nest:* On ground, well sheltered under low branch, or in bush or tree, usually only a few feet from ground; rather large, formed of dry grass and moss with some leaves and rootlets, often lined warmly with feathers or hair, a strong compact structure. *Eggs:* 4 or 5; .85 to .94 by .63 to .71 in.; bluish-white to pale green, thickly spotted with rusty-brown, spots often concealing ground color. *Dates:* June 1 to first half of July, Labrador to Alaska. *Incubation:* Period probably 12 to 14 days; chiefly or wholly by female.

Range. — North America. Breeds in Hudsonian and Canadian zones from tree limit in northwestern Alaska, northern Yukon, northern Mackenzie, northern Manitoba, northern Ontario, Quebec and northern Labrador south to south-central Alaska, northern Alberta, central Saskatchewan, southern Manitoba, southern Quebec, the Magdalen Islands and Newfoundland; winters from eastern Nebraska, northern Missouri, northern Illinois, southern Indiana, southern Pennsylvania, southern New York and Massachusetts south to southern California, southern Texas, Alabama and central Florida; casual in British Columbia.

Distribution in New England. — *Maine:* Common to rare migrant; accidental in winter near coast. *New Hampshire and Vermont:* Common migrant.* *Massachusetts:* Common migrant; rare winter resident, chiefly near coast. *Rhode Island and Connecticut:* Common migrant; rare winter resident.

Season in Massachusetts. — (March 3) March 9 to May 2 (May 17); (August 20, September 5–17) October 2 to November 29 (winter).

Haunts and Habits. The Fox Sparrow is a bird of the lingering snow. It arrives in New England commonly in March, while there is still much snow in the woods, and may be seen along the edges of woodlands, working often in thickets where the ground is bare, and scratching away as if for dear life. This is one of the few of our sparrows that scratches with both feet at once. It leaps into the air, and while off the ground scratches or kicks quickly with both its powerful feet, making them fly as well as everything they touch, before it lands on them again. Thus it is able to excavate rapidly, throwing leaves and dirt sometimes a yard or more. If after it arrives, a snowstorm comes on, covering the ground with several inches of snow and cutting off most of the smaller birds from their chief source of food supply, this does not inconvenience the lusty Fox Sparrow. He excavates! Jumping and scratching he makes the snow fly, and soon is at the bottom of a hole and at his usual occupation of turning over the dead leaves and searching for seeds and insects. It is a pretty and stirring sight to see a flock of Fox Sparrows all at work in this manner, and throwing little jets of snow over the white carpet.

Mr. Arthur W. Phelps, of Pittsfield, Massachusetts, having watched this operation, says that on the first day of the storm while the other sparrows went supperless to bed, the Fox Sparrows not only dug down to the ground, but when each had exhausted the food supply at the bottom of his own little well, he jumped up beside it and tore down another section, thus enlarging his scope of operations from time to time. I have seen

* Miss Inez Addie Howe, of St. Johnsbury, Vermont, wrote that on July 6, 1915, she saw a Fox Sparrow in full song in Danville, Vermont, and that three days later while she was with a party which included Mr. Balch, the [illegible] a pair was found nesting in Lunenburg at high altitude on the mountain side. As both Miss Howe and Mr. Balch are now deceased, verification of this record will be difficult.

Song Sparrows at such a time lingering about the excavations made by the larger bird, ready to snatch a morsel whenever opportunity offered.

The Fox Sparrow is a wild bird, a bird of thicket and forest. It does not seek the habitations of man, unless driven to them by snow too hard and deep for it to penetrate. Then it will come about houses and cattle sheds to look for chaff. One fed under my windows at Wareham, Massachusetts, all one winter on hayseed thrown down on the snow for the birds, and I have seen a number of them feeding under some horse sheds by a church after a severe snowstorm during the latter part of March. Along the coast of southern New England many of them have passed the winter. They are hardy birds, and if any coming to feeding stations have succumbed to the wintry blasts, I have not heard of it. When startled from a roadside thicket or a wood road they usually either fly up into the trees or to a little distance, and when the intruder has passed they immediately go to feeding again. Along the coast they begin to sing about the first of April in damp easterly weather, which may remind them of the fog in their homes along the Labrador coast. The song, though short, is a fine clear effort, a typical song of the northern wilds. Dr. S. D. Judd says that it seems not akin to bird music, but more like the soft tinkling of tiny silver bells. Fox Sparrows have been heard to sing in Massachusetts in October, January, February, March, April and May. They usually are at their best when spring opens. Sometimes in late March a particularly vigorous bird will sing almost continuously for from five to ten minutes with hardly a pause between his individual efforts. Their musical efforts in migration, however, are not to be compared with the full song as given on their breeding grounds. This is well described by Mr. Robert T. Moore.[1]

Often the Fox Sparrows do not stay long in Massachusetts, but pass on rapidly, and arrive at their northern homes while the snow is still deep in the woods. These hardy, early birds are in such haste to begin their domestic life that some of them, realizing perhaps that a nest on the snowy ground would give cold comfort, build their little domiciles in trees or bushes, but most of them wait until there is bare ground enough to receive their nests, for the ground seems to be their normal nesting place. Having raised their young, they will be back again in October or November, passing through on their southward flight.

The food of the Fox Sparrow while in New England consists mainly of seeds — many those of wild fruits. The seeds of weeds form a very large portion of its aliment, those of ragweed and polygonum constituting one half of all its nourishment while here. Mrs. George H. McGregor, of Fall River, Massachusetts, watched one on January 4th, feeding busily on the seeds of petunias, and she says that the bird is fond of millet seeds, but that two preferred hemp seeds. Occasionally one may be seen to feed on the catkins of the gray birch. In spring this species feeds largely on millipeds, ants and beetles.

Economic Status. The Fox Sparrow is a beautiful, harmless bird and to some extent useful on the farms of the United States during the migrations and in winter.

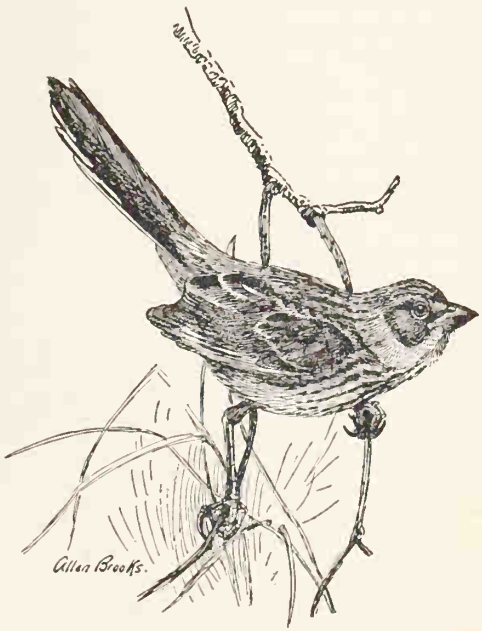
[1] Auk, Vol. XXX, 1913, pp. 177–187.

Pípilo erythrophthálmus erythrophthalmus (Linnæus). Towhee.

Other names: CHEWINK; GROUND ROBIN.

Plate 73.

Description. — A very large sparrow, Catbird size; bill conic, outlines, except ridge, nearly straight; wings short; tail quite long, well-rounded; legs and feet stout and strong. *Adult male:* Head and neck all round, upper breast, and nearly all upper plumage black; a long white patch on lower part of closed wing formed by white basal parts of outer webs of four or more primaries, and a white stripe on upper wing, composed of white outer webs of tertials; a few touches of white toward ends of outer webs of primaries; outer web of outer tail-feather, terminal half of both webs and large part of terminal half of next two feathers white; sides and flanks chestnut or cinnamon-rufous; below white from breast to tail, except under tail-coverts which are lighter chestnut; bill black in summer; iris bright red, but variable, in some quite pale; legs and feet brown to flesh-color. *Adult female:* Similar to male in markings and pattern, but black replaced by brown, and chestnut much paler. *Young in first winter plumage:* Similar to adults; young males may be distinguished by lighter wings and browner primary-coverts; young females indistinguishable from adults of same sex. *Young male in juvenal plumage:* Above, and sides of head cinnamon-brown or darker, obscurely striped with deep olive-brown; wings and tail like those of adult, but black duller, and broad edges of tertials buff or olive-brown; below dull white, strongly washed buffy on breast, sides and flanks and streaked dusky; "iris whitish" (C. J. Maynard); "bill and feet pinkish-buff, the former becoming dusky, the latter dusky-sepia-brown; iris sepia-brown becoming deep red during the winter" (J. Dwight). *Young female in juvenal plumage:* Much like young male in same plumage, but olive-brown replaces black in wings and tail.



Towhee, Juvenile.

Measurements. — Length 7.50 to 8.75 in.; spread 10.00 to 12.25; folded wing 3.20 to 3.90; tail 3.32 to 4.10; bill .53 to .67; tarsus .95 to 1.12. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September), involving body plumage, wing-coverts, tertials and tail; first breeding plumage acquired by wear; adult winter plumage by complete postnuptial molt (August, September); adults have no other molt.

Field Marks. — A very large sparrow, nearly as long as a Catbird and more robust. *Male:* Black above, and below from bill to breast, with chestnut sides and white belly, and with much white in wings and in tail, which he flirts, opens and shuts. *Female and young:* Similarly marked but duller, the black replaced by brown. Very young birds are streaked on breast.

Voice. — Alarm notes and calls variously written as *towhee′, chewink′, joree′, wink rrrink; chuck, chuck; "whit-a whit-a-whit"* (H. D. Minot); song, *"drink-your-tea"; dick′ you, fiddle fiddle fiddle,* or better yet *"chuck-burr, pill-a-will-a-will-a"* (E. T. Seton), most of the foree expended on the *chuck*

the *burr* on a lower key and the rest uttered rapidly; also a "quavering warble difficult of description" (E. A. Samuels); an unusual song *jung* (low) *dee-dee-dee-dee-dee* (high) *ees-ees* (higher) *yŭ-yŭ-yŭ-yŭ-yŭ* (low) (F. H. Allen).

Breeding. — In bushy, scrubby lands, in open woods with shrubby undergrowth or among sprouts where trees have been cut; rarely in open fields or pastures; common about open, swampy woodland, but nests chiefly on dry ground. *Nest:* On ground or near it, in low bush or brush-pile, rarely three or four feet from ground, but usually under bush or tuft of grass (rarely sunk in ground and partly roofed over like that of Oven-bird) built of leaves, bark-strips, weed stems, twigs, grass, etc., lined with fine grass, pine needles or hair, etc. *Eggs:* 4 to 6; .94 to 1.02 by .70 to .79 in.; approaching oval in shape; white, finely dotted over entire surface with reddish-brown and usually some lilac; some have much darker and heavier spots, some are less spotted; figured by E. A. Capen in "Oölogy of New England," Plate X, Figs. 13–15. *Dates:* May 8, Virginia; May 17, Pennsylvania; May 14 to June 12, Massachusetts; June 10 to 30, Maine. *Incubation:* Period 12 to 13 days (C. E. Heil); chiefly by female, male assists. One or two broods yearly. (See Fig. 73.)

Range. — Eastern North America, north to southern Canada and west to the Great Plains. Breeds in Transition and Upper Austral zones from southeastern Saskatchewan, southern Manitoba, southern Ontario, northern New York, extreme southern Quebec, northern Vermont, northern New Hampshire and southwestern Maine (casually to New Brunswick and Prince Edward Island) south to northeastern Oklahoma, northern Arkansas, Tennessee, northern Georgia and North Carolina; winters from southeastern Nebraska, northern Iowa, Illinois, northern Indiana, southern Michigan, northern Ohio, southern New York and Massachusetts to southern Texas, southern Alabama and southern Florida.

Distribution in New England. — *Maine:* Common to uncommon local summer resident in Alleghanian region of southern part. *New Hampshire:* Common summer resident in southern portion, becoming less common northward up to valleys of White Mountains; accidental in winter in southern part.* *Vermont:* Uncommon or occasional summer resident, probably not breeding at elevations over 1,000 feet. *Massachusetts:* Common summer resident; very rare winter resident (winters mostly in southeastern coastal regions). *Rhode Island and Connecticut:* Common summer resident; rare winter resident.

Season in Massachusetts. — April 19 to October 17 (winter).

Haunts and Habits. The active, strong Towhee is a bird of striking appearance. He is noisy and conspicuous whether on the ground or in the air. He rustles the dry leaves like some animal twenty times his size, scratching like a Fox Sparrow with both feet, and even his wing-strokes in flight are noisy, while his flashy tail advertises his progress.

He is a ground bird — an inhabitant of bushy land. No other sparrow in New England seems to be so wedded to life in thicket and tangle. He is rarely seen high in a tree, unless drawn there by some alarm, for his curiosity is great and he follows the crowd that gathers when cries of distress are heard in the grove. He spends most of his life in thicket, "scrub" or sprout land, and so the bushy lands of Marthas Vineyard and Cape Cod are favorite resorts. He is not a dooryard bird except in winter, when necessity now and then drives one to a feeding station, but even then he spends most of his time in the shrubbery, coming out only to secure food. He may be found along bushy fences and roadsides, and often finds food or sand in country roads.

The male arrives in southern New England late in April. He comes in advance of his mate, and after a short time of rest and recreation following the fatigue of the journey,

* Rev. Manley W. Townsend, in a letter dated February 28, 1917, reported seeing one near Nashua early the same month.

PLATE 73

PLATE 73

ROSE-BREASTED GROSBEAK

Page 112

Adult Male in Spring

Adult Female

CARDINAL

Page 110

Adult Male in Spring

Female in Winter

TOWHEE

Page 107

Adult Male

Adult Female

Allan Brooks.

he mounts to the top of some bush or small tree, and gives to the wide world all the music he has. Dr. Frank M. Chapman thus aptly characterizes this bird: "There is a vigorousness about the Towhee's notes and actions which suggests both a bustling, energetic disposition and a good constitution. He entirely dominates the thicket or bushy undergrowth in which he makes his home. The dead leaves fly before his attack; his white-tipped tail-feathers flash in the gloom of his haunts. He greets all passers with a brisk inquiring *chewink, towhee*, and if you pause to reply, with a *fluff-fluff* of his short, rounded wings he flies to a near-by limb to better inspect you. It is only when singing that the Towhee is fully at rest."

Not long after the females arrive, the males begin their wooing, pursuing their brown inamoratas about among the thickets, with a great display of black, white and chestnut plumage. The wings and tails are opened and closed rapidly, so that the white patches of both sexes flash frequently.

While the female is incubating, the male waits upon her and occasionally relieves her on the nest. As the nest is exceedingly well concealed, and the female dull colored, she can sit until almost trodden upon before she leaves the nest; when finally driven from it she is likely to act as if disabled, thus attempting to lure the intruder away. The young usually remain in the nest ten or twelve days, if not disturbed, until their wings grow strong, but if disturbed they may leave it before they are able to fly. When the young have learned to fly, the family keeps together for a time, but seldom, even in migration, is anything like a close flock formed, for Towhees are not normally gregarious. During and after the molt in August all are rather quiet, and shy. When severe frosts come most of them disappear in the night on their southward migration.

The Towhee feeds chiefly on seeds, wild fruit and insects. Its food is obtained mainly from the ground, the shrubbery, and as high up the tree trunks as it can reach or jump. While scratching and digging among the leaves in early spring it unearths many dormant insects, and disposes of them ere they have an opportunity to propagate their kind. Weed seeds, grass seeds, and a little grain are eaten. The only cultivated fruit I have known one to take was now and then a gooseberry or two that had dropped off the bush. Its insect food includes pernicious moths and hairy caterpillars, ants, wasps, flies, grasshoppers and cockroaches, beetles and their larvæ, such as May beetles and their grubs, and wireworms, and in the south the boll weevil. It has been reported as an enemy of the Colorado potato beetle, and the cabbage-worm, but I have not known it to destroy either of these pests. That keen and reliable observer, Mr. Arthur T. Wayne, informs us that as soon as spring arrives in South Carolina these birds "resort to the tallest trees to feed upon the buds," but this habit has not been reported in the North.

Economic Status. The Towhee evidently is a useful bird. Most of the small amount of grain it takes is waste grain. I have received credible reports from farmers to the effect that they had seen the bird pull up sprouting corn — but no corn has been found in the stomachs of birds at work in cornfields.

Cardinális cardinális cardinalis (Linnæus). Cardinal.

Other names: CARDINAL GROSBEAK; VIRGINIA RED-BIRD; KENTUCKY CARDINAL.

Plate 73.

Description. — Bill conic, very large and stout, ridge curved near tip; head sharply crested; wings short and rounded; tail longer and rounded with broad feather-tips. *Adult male:* Front, face and throat black, elsewhere chiefly vermilion-red, darkening above from back of neck to tail (inclusive); bill red or orange-red; iris brown; legs and feet dark reddish-brown. *Adult female:* Similar in shape and shading, though not so full-crested, but different in color; black of face duller or grayish, and more restricted; olive-grayish above; crest, wings and tail similar to those of male, but duller; tawny or buffy below; bill, eyes and feet as male. *Young in first winter plumage:* Like adult, but slightly veiled by gray feather-tips; bill not so red as in adult. *Young in juvenal plumage:* Much like adult female, but duller, more brown; "bill and feet pinkish-buff becoming dusky" (J. Dwight).

Measurements. — Length 7.50 to 9.25 in.; spread 10.25 to 12.00; folded wing 3.30 to 4.00; tail 3.50 to 4.75; bill .66 to .95; tarsus .75 to 1.00. Weight, male 2 oz. (B. H. Warren). Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by complete postjuvenal molt (August, September); first nuptial plumage by wear; adult winter plumage by complete postnuptial molt; adults have but one molt yearly, complete postnuptial.

Field Marks. — Catbird size. *Male:* A long-crested, short-winged, long-tailed red bird with a black mask, and large thick red bill. *Female and young:* Similar in shape, but olive-grayish to more brownish above, and more buffy or brownish below; wings and crest red or reddish.

Voice. — Alarm note a sharp *tsip;* song *whoit, whoit, whoit* etc., *ku-ku-ku* etc. (R. Hoffmann); female also whistles musically — *we-oo, we-oo, we-oo, we-oo, we-oo; chitikew, chitikew, he-wêêt, he-wêêt* (these and six more variations given by W. L. Dawson).

Breeding. — In thickets or among saplings or other small trees, either deciduous or coniferous. *Nest:* A loosely built structure of twigs, leaves, bark-strips, rootlets, weed stems and grasses, and lined with fine grass or hair; from 3 to 30 feet from ground, in tree, vine or bush, but usually quite low; sometimes on top of bush-covered fence or vine-covered stump, or in brush heap. *Eggs:* 3 or 4; .98 to 1.10 by .69 to .82 in.; approaching oval; exceedingly variable, white, grayish-white, greenish-white or bluish-white, variously blotched, spotted and dotted with brownish-gray, reddish-brown, chocolate, yellow-ochre, purplish-brown or lilac; figured by E. A. Capen in "Oölogy of New England," Plate X, Figs. 11, 12. *Dates:* April 5 to 25, Florida; April 30, Pennsylvania; May 5, New York; June 6, Massachusetts. *Incubation:* Period 12 days; by female. Two or three broods yearly.

Range. — Eastern United States (west to the Great Plains) and southern Ontario. Resident and breeds mainly in Austral zones from northeastern South Dakota, northern Iowa, southeastern Minnesota, southern Wisconsin, southern Michigan, southeastern Ontario, central New York and northern Massachusetts south to central Oklahoma, Arkansas, Alabama and northern Florida; casual in southern Quebec, Maine, New Brunswick and Nova Scotia.

Distribution in New England. — Rare visitor, except in New Hampshire, where not recorded; there are now at least fifty New England records that seem to be authentic, many of which have not been published; some probably refer to escaped cage birds; a wild bird and a liberated cage bird nested in Brookline, Massachusetts, in 1898.[1]

Season in Massachusetts. — Occasional at any season.

Haunts and Habits. The Cardinal is one of the few birds of the United States that possesses brilliant plumage and unusual powers of song, and, curiously enough, the

[1] Ives, Ella Gilbert: Bird-Lore, Vol. 1, 1899, pp. 83–87.

female sings a softer song, by no means inferior in its way to that of her mate. It is one of those rare singers that break into song in every month of the year. In the past it was in great demand as a cage bird, but now the law has forbidden such confinement of native birds.

Cardinals are abundant in some of the extreme southern states, but are not common in the northernmost states, and though they reside throughout the year in southern New York and southern Ontario, they do not seem to be able to maintain themselves long in New England. There are many records of the species in this region, but the birds seem to be mere chance wanderers, staying with us for only a brief period, and then disappearing. While here they are seen usually about cultivated lands, and they seem to like the vicinity of dwellings, and, as they are handsome and conspicuous birds, they are observed more readily than some of their plainer neighbors. The Cardinal is a resident throughout the year in the greater part of its range, and in winter when a thick carpet of snow lies on the ground, its plumage shines with unusual brilliance in the reflected light from the snow and stands out in marked contrast to the snowy background.

The male is very attentive to his mate, following her while she is building the nest and singing his most melodious strains, and while she is performing the duties of incubation he brings her choice morsels of food whenever she calls for nourishment. Both parents assume the care of the young, which remain in the nest for nine or ten days. When the young birds are out of the nest and able to fly about, the mother bird leaves them to the care of her mate, who guards and feeds them for three weeks or more, while the female is bringing up the second brood.

According to Mr. W. L. McAtee vegetal products compose the Cardinal's chief subsistence. They constitute over 70 per cent of its food, which consists of 36.38 per cent of weed seeds and other seeds, 24.17 per cent of wild fruit, 8.73 per cent of grain, 1.73 per cent of miscellaneous vegetal substances. Animal food amounts to 28.99 per cent, mostly insects with a small quantity of spiders, small molluscs, etc. Among the important insect pests eaten are the Rocky Mountain locust, seventeen-year cicada, Colorado potato beetle, cottonworm, boll-worm, cotton cut-worm, cotton-boll weevil, coddling-moth, rose beetle, cucumber beetle, fig-eater, zebra caterpillar, plum scale and other scale insects; other pests taken are leaf-hoppers, tree-hoppers, jumping plant-lice and ants. Mr. McAtee gives a complete exposition of its food in his excellent bulletin on the "Food Habits of the Grosbeaks." [1] It has been accused of pulling up young corn, but Mr. McAtee, having examined the contents of 498 stomachs of the species, collected during every month of the year, concludes that it does "at least 15 times more good than harm." It is easily attracted by food in winter and will repay the farmer for protection.

Economic Status. Cardinals were formerly in great demand as cage birds, and Nuttall tells us that Gemelli Careri (who wrote in 1699) said that the Spaniards of

[1] McAtee, W. L.: Food Habits of the Grosbeaks, United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 32, 1908, pp. 7–27.

Havana in a time of public scarcity bought so many that the sum expended for them at ten dollars each reached $18,000.[1]

As Cardinals were caged and sold in many countries, the trapping, handling and sale of these birds was in the aggregate an important business. The only harm done by the Cardinal seems to be its consumption of grain. Mr. Arthur T. Wayne writes that the bird is very destructive to rice and millet.[2]

Hedyméles ludoviciánus (Linnæus). Rose-breasted Grosbeak.

Other names: THROAT-CUT; POTATO-BUG BIRD.

Plate 73.

Description. — Form robust, bill very large and heavy, its lower mandible quite as deep as upper, ridge curved throughout its length; wing longer than tail, which is short and nearly even or very slightly rounded; feet short and stout. *Adult male in breeding plumage:* General color above, and head and neck all around, black. Below (except central part of breast and wing linings), middle wing-coverts, ends of greater coverts, secondaries and tertials, basal parts of all primaries, inner webs of three outer tail-feathers, and rump, white; upper tail-coverts black and white; upper breast, center of lower breast, wing linings and axillars carmine; bill white or grayish-white, ridge and tip usually somewhat dusky; iris brown; legs and feet grayish-blue. *Adult male in winter plumage:* Wings, tail and upper tail-coverts as in breeding plumage; head, neck, back and scapulars brown, streaked black; a central stripe along top of head, another over eye and another on cheek, pale buffy; the white below brownish, and sides tinged rose-pink; sides and flanks streaked dusky. *Young male in first breeding plumage:* Very variable, but often like adult male, except a number of worn, brown flight-feathers and brown edgings to black feathers above; geranium-red or pale pink patch on throat. *Young male in first winter plumage:* Similar to adult male in winter but black parts and upper tail-coverts grayish-brown instead of black; no white in tail and that on wings more restricted; sides and flanks quite tawny; a pink area on throat and upper breast, veiled with buffy, and *wing linings and axillars rose-pink*. *Adult female:* Much like young male in winter, but light markings of head whiter, and only tips of middle wing-coverts white, thus having two white wing-bars; no pink on breast; wing linings and axillars yellow; bill darker than in adult male. *Young female in first winter plumage:* Similar to adult female, lacking the pink throat of young male. *Young in juvenal plumage (sexes nearly alike)*: Similar to adult female, but the two pale wing-bars not so white, and tinged buffy; edge of wing pale rose-pink; wing linings duller with salmon tinge; "bill and feet pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 7.00 to 8.50 in.; spread 12.00 to 13.00; folded wing 3.90 to 4.25; tail 3.10 to 3.55; bill .67 to .75; tarsus .85 to .90. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (beginning in August) involving body plumage and wing-coverts; first nuptial plumage by partial prenuptial molt (late winter) involving body plumage, most wing-coverts, tertials and tail; adult winter plumage by complete postnuptial molt (August); adult breeding plumage by partial prenuptial molt, involving body plumage only; it seems possible that some birds may not acquire highest plumage until third year or even later.

Field Marks. — Size between Bluebird and Catbird. *Male:* A black and white bird with a *great white bill* and *middle of breast rose-red*. *Female:* Shaped like male but in coloration and pattern resembles female Purple Finch, though much larger; bill large as in male Grosbeak, but much darker.

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[1] Chamberlain, Montague: Handbook of the Ornithology of the United States and Canada, based on Nuttall's Manual, Land Birds, Vol. I, 1891, p. 366.

[2] Birds of South Carolina, 1910, p. 131.

Voice. — Alarm note, a sharp metallic *eliek* or *ick* — unlike that of any other New England bird; song, a beautiful, sweet, mellow warble, resembling slightly the Robin's song, but smoother, softer, sweeter, more mellifluous.

Breeding. — Normally in thickets or woodland trees near water; now breeding on farms and in gardens and orchards also. *Nest:* In tall shrub or tree from 6 to 20 feet from ground, near trunk or on fork of limb; loosely built of twigs, vegetable fibres, grass, etc., lined with finer material, rootlets or pine needles. *Eggs:* 3 to 5; .90 to 1.08 by .60 to .78 in.; ovate to rounded ovate; very variable, bluish-green, greenish-blue, dull greenish-gray, greenish-white, grayish-white, etc., spotted and blotched with reddish-brown, dark brown and purplish or lilac; often resembling those of Scarlet Tanager or Summer Tanager, but usually larger than either; figured by E. A. Capen in "Oölogy of New England," Plate X, Figs. 9, 10. *Dates:* June 1 to July, New Jersey; May 23 to June 15, southern New England; June 10 to June 30, Maine. *Incubation:* Period 14 days (F. L. Burns); by both sexes. One brood yearly.

Range. — Eastern North America (west to the Great Plains), Central America and northern South America. Breeds in lower Canadian and Transition zones from central-southern Mackenzie, northern Saskatchewan, southern Manitoba, central Ontario, southern Quebec, New Brunswick and Cape Breton Island south to central-eastern Kansas, southern Missouri, southern Illinois, Kentucky, southern Ohio, Pennsylvania and New Jersey, and in the mountains to northern Georgia; winters from southern Mexico and Yucatan to Colombia, Venezuela and Ecuador; migrates through Cuba; casual in Jamaica, the Bahamas and Bermuda Islands; accidental in Montana, Arizona, Colorado (nesting) and California.

Distribution in New England. — *Maine:* Common to rare migrant and summer resident, except in eastern part; somewhat local. *New Hampshire:* Common migrant and summer resident, except at high elevations, but somewhat local. *Vermont:* Common migrant and summer resident up to about 2,500 feet. *Massachusetts:* Common migrant and summer resident, chiefly in northern part. *Rhode Island:* Common migrant and summer resident. *Connecticut:* Common migrant and summer resident, accidental in winter.

Season in Massachusetts. — (April 26) May 2 to October 3.

Haunts and Habits. Nearly sixty years ago there stood, some half a mile from my father's house, near Worcester, Massachusetts, a tract of heavy timber shading a living spring, from which ran a little brook meandering down to the lake two miles away. There one bright June day on the bank of the stream occurred my first meeting with the Rose-breasted Grosbeak. A beautiful male bird sat upon the frail nest, about ten feet from the ground in a tall shrub. When I saw that black bird with a large white bill, I hailed it as a new species, thinking it to be a female, not knowing that the male grosbeak relieved the female on the nest. Those great woods were cut off long ago, and the spring has disappeared along with the stream that flowed from it, but I still recall the very look of that bird as from the nest he regarded my approach with bright startled eyes, his head cocked on one side. Since then frequently I have seen the male bird performing his share of the duties of incubation. At Concord, Massachusetts, by the river side, there was at one time a nest in a tree that hung over the roof of the cabin, and the male bird sitting there commonly sang while on the nest. When a hawk flew overhead he continued to sing, but so reduced the volume of the song that it seemed to come from far away, raising his voice again when the hawk had passed on. Singing on the nest and ventriloquizing are common habits of the male.

The Rose-breasted Grosbeak is an admirable bird. It is beautiful, tuneful and useful, which from a human standpoint is about all that could be desired. The male

assumes his full part of the family duties, and is very devoted to his partner, and their young. While the female is incubating he feeds her, and when not incubating himself, stands guard over his mate and home, and cheers her with his wonderfully sweet song.

Normally the Rose-breasted Grosbeak is a forest bird, nesting usually in thickets about swamps, lakes and streams. Deciduous or mixed woods are as one to him. He inhabits birches and alders, and the low growth near the water, but usually sings from tall trees. He may be looked for early in May in southern New England. The males usually come first, and when the modestly attired females arrive they are pursued with fierce rivalry. Sometimes from four to six males may be seen paying attentions to one female. They dart from twig to twig, pouring forth their sweetest songs, or hover about her in the air, both singing and fighting at the same time. Their battles sometimes are sanguinary as the beak of the bird is a powerful weapon. I have seen such a fracas but once, but it is well worth seeing. When the battle is won the female, though apparently indifferent during it all, accompanies her conquering hero as he leaves the scene. Having won her he seldom leaves her for long until the young are able to care for themselves.

Fifty years ago the bird was far less common in New England than it has been since the twentieth century came in. Once it nested only in the woods. Now its breeding grounds have been extended to the farm and village, while it still occupies the woodland breeding grounds. Its numbers, however, fluctuate; it may appear commonly for a few years in a section, and then suddenly become rare.

According to Mr. W. L. McAtee the proportions of animal and vegetal food eaten by the Rose-breasted Grosbeak are 52 and 48 per cent respectively. Among its animal aliment we find many insect pests such as click beetles, wood-borers, leaf-beetles, curculios, scale insects, plant-lice, stink-bugs, hawk moths and nocturnal moths, span-worms and ants. In Massachusetts we have seen it in the act of devouring the caterpillars of the gipsy moth, and those of the common tussock moth, also the tent caterpillar, the forest tent caterpillar, the brown-tail caterpillar and the army-worm. It is an inveterate enemy of that pernicious pest, the Colorado potato beetle. Mr. M. C. Howe, of Monson, Massachusetts, wrote to me on January 14, 1918, "I had a chance to observe a pair of these birds that were in my garden two years ago; they kept the potato patch entirely free from the Colorado potato beetle." This is now a well-recognized habit of the bird which has been known in some places as the "Potato-bug Bird." The vegetal food consists largely of wild seeds and wild fruit. It takes many weed seeds and tree seeds, and also in spring many buds and blossoms of trees. A small quantity of grain is taken, and sometimes rather an excessive number of peas.

Economic Status. The destruction of the buds of forest trees by this Grosbeak is only a form of natural pruning which ordinarily never injures the trees, and the blossoms destroyed are principally the sterile, staminate flowers which are unproductive. The bird occasionally raids garden peas, corn and sprouting wheat, but the damage done in this way is far more than compensated by the service of the bird in destroying noxious

insects. Mr. W. L. McAtee says "few birds have so good a record both as to the large numbers of important pests attacked and the slight amount of damage done." [1]

Hedymeles melanocéphalus (Swainson). Black-headed Grosbeak.

Note. Four reports of the occurrence of this species in New England have come to my attention within the last decade. The observers had every opportunity to study the birds, which were males in each case, and probably these are authentic reports, but as I find no previous eastern record, we should wait for the capture of a specimen in New England, before giving another bird from the far west a place on our list.

Guíraca cærúlea cærulea (Linnæus). Blue Grosbeak.

Plate 74.

Description. — Bill not so convex as in Rose-breasted Grosbeak, ridge nearly straight; wings, tail and feet shaped much as in Rose-breasted Grosbeak (see page 112), but claws relatively longer. *Adult male:* General color rich dark blue or greenish-blue, darkening on back, with dusky streaks; feathers in narrow strip around bill black; wings and tail black or blackish, latter with bluish feather-edges; most of middle wing-coverts and edges and tips of greater coverts bright chestnut-brown; tertials margined brown; some whitish edgings or tips on under tail-coverts; bill dusky above, light blue or bluish below; iris brown; legs and feet dark brown. *Adult male in winter plumage:* Similar to adult male in summer, but blue much obscured by brownish or buffy feather-margins and tips; feathers of flanks and abdomen margined and tipped with pale buff or whitish, and outer tail-feathers edged white toward tips. *Immature male in first breeding plumage:* A mixture of plumages of adult male and female, showing more or less blue with the brown, and worn brown primary-coverts. *Adult female in breeding plumage:* Olive-brownish above with slight tawny tinge, more grayish on rump, upper tail-coverts and tail; back and scapulars with more or less dark feather-centers; wings and tail dusky-brown, former edged with light brownish and latter with dull grayish-blue; wing-coverts and tertials margined and tipped much as in adult male; edges of primaries also brown; below brownish-buffy, sometimes indistinctly streaked buffy on sides of breast, sides and flanks; some bluish about head, rump and wing-coverts; some mature birds show some scattered blue feathers; bill brownish, paler below. *Adult female in winter plumage:* As adult female in summer, but colors deeper. *Young in first winter plumage:* Like adult female in winter, but color a little brighter and deeper; flight-feathers more worn. *Young in juvenal plumage:* Similar to first winter plumage, but colors lighter; wings and tail clove-brown, edged with lighter brown.

Measurements. — Length 6.35 to 7.50 in.; spread 10.50 to 11.50; folded wing 3.30 to 3.60; tail 2.70 to 3.00; bill .58 to .67; tarsus .70 to .82. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September) involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (winter) involving part of body plumage, all or part of tail, and in some cases some flight-feathers; adult winter plumage by complete postnuptial molt; adult breeding plumage by wear; some birds may require three or four seasons to assume highest adult plumage; adults have but one annual (postnuptial) molt.

Field Marks. — Size of Bluebird or Cowbird, which latter it resembles somewhat at a distance, when like Cowbird it appears black; only the Indigo Bunting can be mistaken for this bird in a good light, and the Blue Grosbeak is much larger, has a relatively larger bill, and has two *brown* wing-bars, the forward one being *very wide* and rich chestnut-brown. *Female and young:* Similar in shape to male, but brown with two wing-bars resembling those of male.

[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 32, 1908, p. 57.

VOICE. — Said to resemble that of Indigo Bunting, especially the song which is said to be sweet, reminding one of the carol of the Purple Finch; alarm note, a loud *chuck* (Wilson).

BREEDING. — Usually in low trees or thickets or near edges of woods, but has nested in city street tree where vehicles constantly passed just below. *Nest:* On low branch of tree; composed of bark strips, rootlets, grass, etc., or dry leaves, weeds and grass, lined with rootlets, sometimes with hair; usually the cast-off skin of a snake or part of one is incorporated. *Eggs:* 3 to 5; .60 to .66 by .84 to .98 in.; ovate; light blue, fading to white if exposed to light (very rarely spotted); figured in "Nature Lovers Library, Birds of America," Plate No. Five, Fig. 19. *Dates:* May 9 to July 11, Georgia; June 3, August 5 and 24, Virginia. *Incubation:* Chiefly or wholly by female. Two broods yearly.

RANGE. — Eastern United States mainly and south to Central America. Breeds in Austral zones west to the Great Plains from eastern Kansas, Iowa (casually), Missouri, Illinois, Maryland and Pennsylvania south to eastern Texas, Louisiana, southern Alabama and southern Florida; winters in Yucatan and Honduras; casual in the northern United States from Wisconsin to Maine, and in southern Quebec, New Brunswick and Nova Scotia; accidental in Cuba.

DISTRIBUTION IN NEW ENGLAND. — Very rare or casual migrant and probable local summer resident; no fully authenticated breeding record. Records: *Maine:* South Paris, "since 1916 every summer" (observed June 4, 1916, June 4, 1917, May 18, 1918, May 22, 1919), "there have been several pairs in different parts of the village";[1] Fryeburg, June 6, 1917, one pair arrived and stayed the rest of the summer, but "I could not find nest"; May 25, 1918, three pairs came, two of which nested; August 23, 1919, a pair seen; June 16, 1920, three seen; July 11, 1921, one pair seen; June 20, 1923, three arrived and two of them (males) seen until July 22; July 20, 1925, a pair seen;[2] West Baldwin, in 1918 and 1919 a pair nested; Auburn, July 6, 1918, a male seen, also one June 27, 1922;[3] Bangor, August 24, 1919, bird seen by Dr. Ada O. Fogg; March 10, 1926, one seen by Miss Mary Clayton; Hampden, 1921, bird seen several times during summer by Mrs. Percy Flanders and Mrs. L. C. Stearns; April 23, 1922, immature male observed by Mrs. W. C. Bryant; May to June 18, 1922, one seen by Mrs. Percy Flanders;[4] Gorham, June 27, 1922, one male observed, and May 29, 1926, one seen.[5] *New Hampshire:* East Derry, May 26, 1894, an adult male observed;[6] Jackson, 1917, a pair nested, "birds and nest were seen by the late Mrs. Frederick Abbott";[7] Franklin, 1927, 1928, 1929, one or more birds seen each summer by Mrs. David Atwood.[8] *Vermont:* Holden, August 10, 1925, one noted.[9] *Massachusetts:* Greenwich, May 23, 1918, one, Miss Eva L. Powers; West Stockbridge, June, 1918, one, Miss Lottie S. Kniffen; Southampton, June 27, 1918, one, Miss Bessie M. Graves; Roslindale, May 23 and 27, 1919, one, Miss U. C. Sherman; Taunton, February 23, 1920, three, Mrs. D. A. Burt; Barre, March 29, 1920, one, F. J. Holman; Montague, May 15 and 16, 1920, one, Miss F. W. Rockwell; Brookline, May 30, 1920, one, Mrs. M. M. Kaan; Lincoln, July 30, 1920, female, A. J. Parker; Newton, August 3, 1920, young male, F. H. Kennard;[10] Lancaster, July 10, 1921, one, Herbert Parker; Danvers, September 23, 1921, one, S. G. Emilio; Springfield, May 12 and 14, 1922, one, Miss F. A. Stebbins; Lincoln, May 26, 1922, one, Kenneth Hamilton (reported by Mrs. A. B. Harrington); Dedham, June 9, 10 and 28, 1922, one, Mrs. M. M. Kaan and others; Sandwich, July 29, 1922, one, Mrs. George Burbank; Springfield, May 11 and 15, 1923, one, Mrs. R. G. Sherwood; May 16, 1926, eight, May 17, four, May 18, two, May 20, one, Mrs. E. M. Ingalls and others; Townsend, May 23, 1923, one, Mrs. J. J. Piper; Sunderland, May 26, 1923, one, Miss E. M. Smith; South Hadley, June 8 and 15, 1924, one, Mrs. E. M. Ingalls; Huntington, June 14, 1924, male, June 16, female, A. A. Cross; Dennis, May 19, 1925, one, Miss J. O. Crowell; Amherst, May 25, 1926, one, Miss E. M. Smith.[11] *Rhode Island:* Block Island, April, 1926, one seen by Miss Elizabeth Dickens.[12] *Connecticut:* New Britain, May 14 and 15, 1924, six males seen by Arthur G. Powers

[1] Park, Mrs. A. D.: *in litt.*
[2] Abbott, Miss Harriet: *in litt.*
[3] Waterman, W. H.: *in litt.*
[4] Brown, Miss Bertha L.: *in litt.*
[5] Lombard, Mrs. Herbert: *in litt.*
[6] Berry, Miss Mabel C.: Auk, Vol. XIII, 1896, pp. 342, 343.
[7] Abbott, Miss Harriet: *in litt.*
[8] Campbell, Franklin C.: *in litt.*
[9] James, T. A.: *in litt.*
[10] Auk, Vol. XLV, 1928, p. 223.
[11] All *in litt.*
[12] Dickens, Miss Elizabeth: *in litt.*

PLATE 74

PLATE 74

BLUE GROSBEAK
Page 115

Adult Male

Female

INDIGO BUNTING
Page 118

Adult Male in Spring

Female

HOUSE SPARROW
Page 39

Adult Male

Adult Female

DICKCISSEL
Page 121

Adult Male

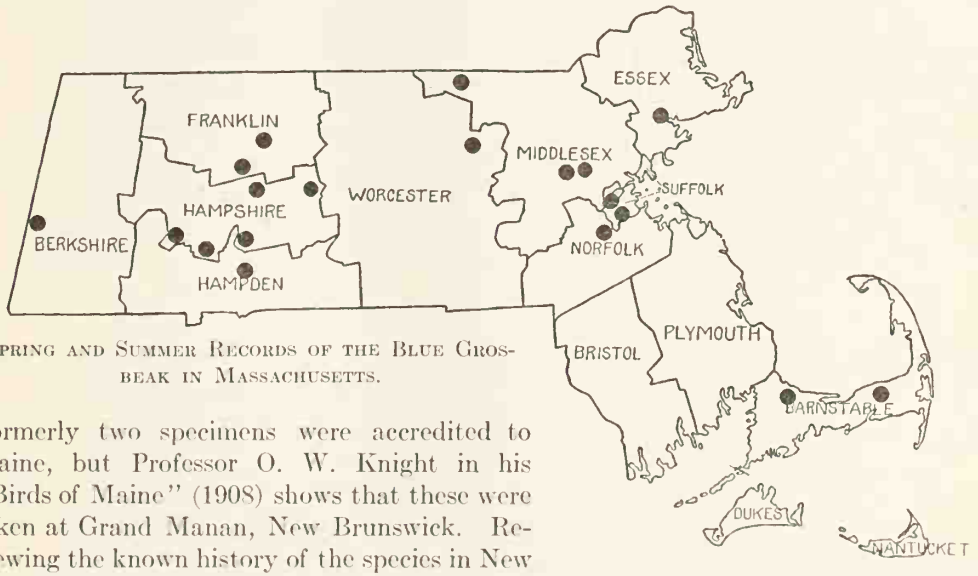
Adult Female

Allan Brooks.

and others;[1] South Windsor, June 15, 1927, male seen, about August 1, female seen, and both birds seen "off and on" until September 1 — "Mr. C. W. Vibert, who saw them many times, is convinced that the pair nested."[2]

Season in Massachusetts. — May 11 to September 23 (February, March).

History. The Blue Grosbeak has been regarded as a southern bird which almost never appeared in New England. Peabody in his report on the birds of Massachusetts in 1839 mentions the fact that one was unquestionably seen "by a friend."[3] Howe and Allen in their "Birds of Massachusetts" (1901) refer to only one definite record — a male bird shot by Mr. Gordon Plummer, Brookline, May 29, 1880.[4]



Spring and Summer Records of the Blue Grosbeak in Massachusetts.

Formerly two specimens were accredited to Maine, but Professor O. W. Knight in his "Birds of Maine" (1908) shows that these were taken at Grand Manan, New Brunswick. Reviewing the known history of the species in New England up to 1908, we find only one specimen taken. It may be that the bird was merely fortuitous here in the past, but the records of more recent observers as given above show that such is no longer the case. I have never seen the bird alive, and so far as my knowledge of the matter goes, collectors have taken but one in New England. In the past, however, no ornithologist in New England had been in communication with several hundred correspondents intensely interested in birds (most of them of mature years and experience), scattered over the six New England states, and all interested in recording rare birds. It has been my pleasure during the past ten years to receive communications regularly or periodically from this considerable number of interested observers, whose coöperation I gratefully acknowledge, and together we have learned something about the distribution of this species in New England. It is improbable that any one of these

[1] Powers, Arthur G.: *in litt.* [2] Hunt, Miss Lucy O.: *in litt.*

[3] Peabody, William B. O.: Report on the Ornithology of Massachusetts, 1839, p. 330.

[4] Allen, J. A.: Bulletin, Nuttall Ornithological Club, Vol. V, 1880, p. 184.

persons would mistake an Indigo Bunting for a Blue Grosbeak, except perhaps in a case of very casual and brief observation. Moreover, the Blue Grosbeak is a rather sedentary bird, and in its migrations it stays for days in a limited neighborhood. Often when one interested observer discovers the bird, the word is passed around, and many people have an opportunity to look it over at leisure, thus insuring its identification by a number of competent observers. Where an observation is substantiated by a number of such credible witnesses, the report must be regarded as authentic.

The few migrants of this species that reach New England evidently choose for the most part the Connecticut Valley as their route of migration. A very few pass up the Atlantic coast, and scattering birds are recorded between the two routes. Some of these birds evidently reach parts of southwestern Maine, but beyond that region to the north and east we have no recent reports. I suspect that the bird appears less rarely in New York State than the records indicate. Dr. Arthur A. Allen informs me that it has been reported from every county in that state. Professor E. H. Eaton says in his "Birds of New York" that it seems almost impossible that the numbers reported by different observers "could be actual occurrences," but if all such reports had been carefully investigated, the number of authenticated occurrences might have been surprising.

Haunts and Habits. The Blue Grosbeak is said to be a rather tame and unsuspicious bird, though also said to be somewhat shy and retiring at nesting time, when it seems usually to prefer to inhabit thickets near water. In migration it may be found also on the dryer lands, and it frequently visits farms and villages. During the nesting period these birds and their young feed very largely on noxious insects, such as grasshoppers, and also on cut-worms and other pernicious caterpillars. In both spring and autumn they take some grain.

Economic Status. Evidently Mr. W. L. McAtee, the expert on the food of grosbeaks, considers this bird as serviceable to the farmer, for he says that it deserves protection for its destruction of grasshoppers alone.[1]

Passerina cyánea (Linnæus). Indigo Bunting.

Other name: INDIGO-BIRD.

Plate 74.

Description. — Similar in shape to Blue Grosbeak, but bill relatively smaller, its ridge somewhat convex. *Adult male in breeding plumage:* Deep blue, variously described as cerulean, ultramarine and indigo, but changing in different lights; head plain purplish-blue, rest of blue plumage showing greenish reflections; lores, wing-coverts, tail-feathers and flight-feathers dusky, the latter two edged blue (except tertials which are black broadly edged blue); bill dusky above, pale bluish or whitish below with a narrow central line of black; iris brown; legs and feet brown. *Adult male in winter plumage:* Somewhat similar to adult female, but plain brown above, most of the blue now concealed by brown feather-edges with blue showing on rump, edges of greater wing-coverts, primary-coverts, primaries and tail; below

[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 32, 1908, p. 85.

Photograph by Harry G. Higbee

FIG. 74. — NEST AND EGGS OF INDIGO BUNTING

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Photograph by C. E. Leister

FIG. 75. — SCARLET TANAGER, FEMALE, NEST AND YOUNG

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paler brown, sometimes becoming whitish on chin, abdomen and under tail-coverts, and showing partly veiled blue feathers, which appear like cross-wise spots. *Young male in first breeding plumage:* Very variable; similar to adult male, but all show *worn brown primary-coverts;* usually a mixture of blue and brown on wing-coverts; often both bright and dull blue feathers are seen on rump and head. *Young male in first winter plumage:* Similar to female, but usually showing some blue feathers and some whitish feather-tips below. *Adult female:* Above olive-brownish, darker on top of head, sometimes indistinctly striped darker on back and scapulars, but not on rump or upper tail-coverts; wings and tail dusky, the feather-edges lighter as in male, these mostly grayish-green, but those of middle wing-coverts brownish; below pale whitish, tinged olive-buffy, and very indistinctly streaked dusky-grayish-brown on breast; bill, iris and feet much as in male; the *central black line on lower mandible* distinguishes female from other sparrows; old females tend toward masculine plumage, showing some blue feathers. *Young in juvenal plumage:* Similar to adult female, but plumage softer, and more streaked below; young males often show traces of blue.

Measurements. — Length 5.25 to 5.75 in.; spread 8.00 to 8.90; folded wing 2.60 to 3.00; tail 2.20 to 2.60; bill .37 to .41; tarsus .65 to .70. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (late August, September) involving body plumage and wing-coverts, and sometimes some flight-feathers and tail-feathers; first breeding plumage by variable partial molt (late winter to mid-April) involving more or less of body plumage and wings and all of tail, but not primary-coverts except sometimes the first; adult winter plumage by complete postnuptial molt; adult breeding plumage acquired by partial prenuptial molt and by wear; adults have complete postnuptial molt (August, September); male becomes blue in summer by partial prenuptial molt and by wearing away of brown edges and tips of blue feathers.

Field Marks. — Size, slightly larger than Chipping Sparrow. *Adult male:* The only adult bird of this size that is blue practically *all over; bill dark above, pale bluish below;* bird looks black at a distance; in autumn brown above, but wings and tail chiefly blue. *Immature male:* A mixture of brown and blue with whitish feather-tips below, some quite blue with brown wing-coverts, like those of the Blue Grosbeak. *Female and young:* Plain brownish, indistinctly streaked; very young similar to female but more streaked below.

Voice. — Alarm note a sharp *chip*, resembling the sound made by striking two pebbles together, also a *chuck;* song *she tshe tshe — tshé tshéé tshéé — tshé tshé tshe,* or *tshea tshea tshea tshrèh* (T. Nuttall); often given as sets of phrases in high key, and then repeated in slightly lower key, as *swee-swee-swee, swee-swee* (slightly lower), *sweet-sweet-sweet, swee-swee* (slightly lower), *swee, swee, swee* (R. Hoffmann); the song finishes *diminuendo.*

Breeding. — In bushy lands, such as bushy pastures, scrub, briery hillsides or slash and sproutland where woods have been cut off. *Nest:* In bush or brier-patch, sometimes in garden shrubbery or orchard, usually very low, but rarely in old orchard tree 10 or 12 feet from ground, or in grape vine; built of twigs, coarse grass, weeds and a few leaves, lined with fine grass and sometimes with hair or feathers. *Eggs:* 3 or 4, rarely more; .70 to .81 by .50 to .60 in.; nearly oval; pale blue or bluish-white, sometimes with greenish tinge, rarely mottled with brown; figured by E. A. Capen in "Oölogy of New England," Plate X, Fig. 8. *Dates:* May 27 to June 12, Virginia; June 3 to 22, Massachusetts; late June to July 15, Maine. *Incubation:* Period 12 days (F. L. Burns); by female chiefly, but sometimes by male also. One or two broods yearly. (See Fig. 74.)

Range. — Eastern North America west to the Great Plains, north to southern borders of Canadian Zone and south to Central America. Breeds chiefly in Transition and Austral zones from southern Saskatchewan, southwestern Manitoba (casually), central Minnesota, Wisconsin, northwestern Michigan, southern Ontario, southern Quebec and southern New Brunswick south to central Texas, southern Louisiana, southern Mississippi, central Alabama and northern Florida; migrates south through eastern Mexico to Central America; winters from Morelos and Yucatan, through Central America to Panama

and north to the Bahama Islands, casually to the Bermuda Islands and northern Florida; casual in eastern Colorado, southern Saskatchewan, eastern North Dakota and Nova Scotia.

Distribution in New England. — *Maine:* Common summer resident in southwestern portion, rather uncommon or rare and local elsewhere. *New Hampshire:* Common migrant and summer resident in southern part, breeding north in valleys of White Mountains and up to elevations of 1,500 feet. *Vermont:* Common migrant and summer resident, occasionally reaching highest summits. *Massachusetts:* Common migrant and summer resident generally, but rare in Cape Cod region. *Rhode Island:* Common summer resident in western and northern sections, absent or rare elsewhere. *Connecticut:* Common migrant and summer resident.

Season in Massachusetts. — (April 17) May 8 to October 29 (December 5).

Haunts and Habits. How came this brilliantly-garbed little creature to make its home in the North? Dressed in changeable, tropic blue, it nevertheless breeds as far north as Ontario, northern New England and Nova Scotia. It is the only one of the little "painted" buntings to range so far to the northward; the others are all typically southern birds, but this one being virile and prolific may have gradually worked toward the Pole, to find more room for its increasing numbers, until it finally reached its present farthest north. Even now it has not grown hardy. We rarely see it until the May days grow warm, and most of the northern members of its race are on their southward way before the middle of September. In spring the males come several days before the females appear. Soon they start to sing, and when the females come pairing begins. Then the male follows his prospective mate hour after hour in full song. When the union has been consummated, the nest built and the eggs laid, the mated pair seem to dwell in different zones. The female quietly incubates or keeps largely to the bushes near the ground, where, modestly clad and unobtrusive, she is seldom seen; while the brilliant male sings conspicuously, high in the tree-tops or from roof or chimney top; nevertheless he sometimes relieves the female on the nest. His plumage is so changeable that in one position it appears blue and in another or in a different light it seems green, while at a distance it appears quite black.

When as a boy I was on my way home from a morning woodland excursion, under the hot sun of a June noon, the gay Indigo Buntings were always conspicuous songsters, as they perched on the telegraph wires along the way, but I rarely saw a female unless I began exploring the bushes in the neighborhood of the nest. Then her nervous chipping apprized me of her whereabouts and soon she was joined by the male as she protested with twitching wings and tail against the rude invasion of her humble domain. The male seems to delight in singing during the hottest part of the summer days, when other birds are resting in the shade. He will sing his way from the bottom of a tree to the top, going up branch by branch until he has reached the topmost spire, and there, fully exposed to the blazing sun, he will sing and sing and sing. His song period often continues well into August or until a second brood is under way. My latest record for fresh eggs of this bird came from Mr. Adelbert Temple, of Hopkinton, Massachusetts, who found a nest three feet from the ground in a small ash tree on August 14, 1919. The eggs were pure white, which is rather unusual.

When two broods are reared, the same nest may be used for both, and it is sometimes repaired and occupied year after year. The young remain in the nest from 10 to 13 days. The male often seems to do little but enjoy himself and sing to the female, while she is incubating the eggs and caring for the young in the nest, but when the little brood is ready to leave the nest, he begins to show more interest in his progeny. In late summer when the corn has "tasseled out," the Indigo Buntings seem to find some food about the corn tops and often may be found in cornfields. When the young have waxed strong and fat, and the male has donned his sober brown fall dress, they are all ready to depart, and by the time they have reached South Carolina in October they have gathered in considerable numbers.

The food of the Indigo Bunting in New England consists largely of insects. Caterpillars, including canker-worms and brown-tail caterpillars, many small beetles, among them click beetles (the parents of wire-worms) and curculios are eaten and very many grasshoppers. The greater part of the vegetal food consists of the seeds of grasses and weeds, most of which they consume in the South in winter, and there they occasionally pick up some grain.

Economic Status. The Indigo Bunting does comparatively little damage to grain in the South, and practically none in New England, where its economic value is apparent. Occasionally it eats a few blossoms from fruit trees, but not enough to harm them.

Passerina círis (Linnæus). Painted Bunting.

Note. There are several records of the occurrence of this species in New Engand, but as great numbers have been caged in the past, it has been assumed that they were all escaped cage birds. Now that the keeping of American native birds in cages is illegal, any bird of this species taken here in unworn plumage should constitute an authentic record.

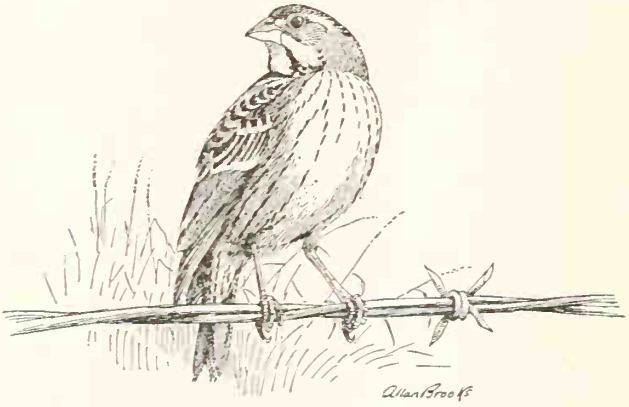
Spíza americána (Gmelin). Dickcissel.

Other names: BLACK-THROATED BUNTING; LITTLE MEADOWLARK.

Plate 74.

Description. — Shaped somewhat like Indigo Bunting, but bill longer for its depth, wings relatively much longer and tail a trifle more forked. *Adult male in breeding plumage:* Top of head, hind neck, sides of neck and ear region gray, often tinted more or less olive on forehead and crown; narrow stripe over eye, bright yellow, sometimes passing into white behind eye; back and scapulars light grayish-brown, streaked black; rump paler, grayer, unstreaked; upper tail-coverts grayish-brown with some blackish shaft-streaks; lesser and middle wing-coverts bright reddish-brown, almost chestnut; greater coverts, flight-feathers and tail-feathers dusky, edged brown, the edgings broadest and brownest on coverts and tertials, and narrower and graying on other flight-feathers and tail; edge of wing around bend deep bright yellow; a touch of yellow on jaw passes posteriorly into white; chin and throat white with large black patch on throat, sometimes continued down middle of breast, and sometimes divided into two patches; breast yellow which passes into white on abdomen or farther back; under tail-coverts white; sides and flanks shaded gray; wing linings tinted yellow; bill dusky on sides, rest bluish; iris brown;

legs and feet grayish-brown. *Adult male in winter plumage:* Colors brighter, but black throat-patch more or less veiled by pale feather-tips; gray of head and neck replaced by dark olive-brown, and under tail-coverts buff; iris brownish; feet grayish-brown; bill brownish tinged with yellow (S. Sumichrast). *Young male in first winter plumage:* Above, including ear region, wood-brown or sepia, narrowly and obscurely streaked on top of head and broadly on back with black; wing-coverts almost entirely rich russet or cinnamon-rufous, as in adult; chin and abdomen pale buff; throat, sides and under tail-coverts with obscure narrow black streaks; a black streak on each side of chin as in adult female; stripe above eye, another on jaw, and usually lower throat, dull yellow; edge of wing lemon-yellow; lores grayish (adapted from J. Dwight). *Adult female:* Similar to adult male, but colors duller, head and neck plainer, top of head streaked, less tinged with yellow below, throat pale brown with little or no black, a black streak on each side of chin, and some streaks on upper breast. *Young in juvenal plumage:* Similar to young male in winter plumage, but lighter, more buffy above and duller below, where streaks are dusky instead of black.



DICKCISSEL, YOUNG MALE IN SECOND PLUMAGE.

MEASUREMENTS. — Length 5.75 to 7.00 in.; spread 9.00 to 11.00; folded wing 2.80 to 3.50; tail 2.20 to 2.90; bill .53 to .58; tarsus .54 to .56. Female smaller than male.

MOLTS. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (late June to August) involving body plumage, wing-coverts and tertials; first breeding plumage by partial prenuptial molt (March, April) involving head, throat and breast, when young bird becomes as adult; adults have complete postnuptial molt and partial prenuptial molt, as in young.

FIELD MARKS. — Somewhat smaller than Bobolink. *Adult male:* A light colored sparrow with a yellow line over eye, white throat and yellow breast, with large black patch just below throat; seen in front view, with its yellow breast and black, often crescentic, patch *below* throat, resemblance to Meadowlark is striking; in the west it is often called "Little Meadowlark." *Female and young:* Have less yellow, breast more or less streaked, and lack the black patch on throat; they resemble female and young of Bobolink, but fore wing near bend bright reddish-brown (nearly chestnut).

VOICE. — Song *dick dick dickcissel*, a simple clinking strain, not particularly musical, with some variations, represented as "*look! look! see me here! see!*" (Coues), sometimes shortened to *dick! dick!* or *dickcissel*.

BREEDING. — In grass fields, grain fields, meadows, pastures and prairies. *Nest:* On ground or raised up among grass stalks, or in bush or small tree; composed of leaves, grasses, hair, etc. *Eggs:* 3 to 5; about .80 by .60 in.; near rounded oval; bright greenish-blue; figured by E. A. Capen in "Oölogy of New England," Plate X, Fig. 7. *Dates:* May 18, southern Indiana; June 18, southern Michigan; June 9 and August 1, Massachusetts. *Incubation:* Period at least 10 to 11 days, possibly more (A. O. Gross); by female. Two broods yearly.

RANGE. — Eastern North America west to the Rocky Mountains, Central America and northern South America. Breeds chiefly in Austral zones from northeastern Wyoming, southern Saskatchewan, southern Manitoba, central North Dakota, northwestern Minnesota, Wisconsin, southern Michigan and (formerly at least) southeastern Ontario south to southern Texas, southern Louisiana, Mississippi and central Alabama and west to central Colorado; formerly bred on the Atlantic slope from Massachusetts

to South Carolina and Georgia, but now very rare or casual in that region; migrates through Mexico and Central America; winters from Costa Rica and Panama to Colombia, Venezuela, Trinidad and French Guiana; accidental in British Columbia, Lower California, Arizona, New Mexico, New Hampshire, Maine, Prince Edward Island, Nova Scotia and Jamaica.

DISTRIBUTION IN NEW ENGLAND. — Accidental visitor, formerly uncommon summer resident along coast and in western valleys of Massachusetts and in Connecticut, and rare migrant in Rhode Island. Records: *Maine:* Professor O. W. Knight gives three records in "Birds of Maine," 1908, p. 444; a recent record is Patten, June 9, 1922, one seen.[1] *New Hampshire:* Concord, October 13, 1918, immature male taken by Francis B. White.[2] *Massachusetts:* Howe and Allen in "Birds of Massachusetts," 1901, p. 117, refer to nine records; others are, Ipswich, Dr. C. W. Townsend mentions a "fine adult specimen in the collection of the late Dr. Charles Palmer, at Ipswich, probably taken in that vicinity";[3] Magnolia, August 27, 1879, one taken by Mr. W. S. Townsend, and in the collection of Dr. C. W. Townsend;[4] Waban, August 12, 1899, over 30 seen by Miss Clara L. Willis, of Framingham, who writes in a letter dated September 8, 1918, "I was naturally amazed at the sight. However I knew my birds well, followed them, studying them carefully for an hour or more";[5] Winthrop, July 25, 1905, pair seen, of which the male was collected by J. K. Murray;[6] Marthas Vineyard, September 6, 1918, adult male seen;[7] Edgartown, September 18, 1918, male seen[8] (probably these last two records are referable to the same bird); Groton, November 18, 1925, a female trapped and banded by William P. Wharton.[9] *Rhode Island:* Newport, September 25, 1888, young bird taken by Lieut. Wirt Robinson;[10] Block Island, June 2, 3 and 5, 1922, one seen;[11] Pawtuxet, December 20, 1922, bird seen for several days, then trapped and banded on date given, by Henry E. Childs.[12] *Connecticut:* Lisbon, April 2, 1922, three seen and a fourth heard.[13]

SEASON IN MASSACHUSETTS. — May 15 to October 3 (November 18).

HISTORY. Early American ornithologists found the Dickcissel abundant in the middle Atlantic states, and Thomas Nuttall, writing in the early part of the last century, said that the bird was not then uncommon along the coast of Massachusetts in the fields near the salt-marshes. The bird virtually disappeared from the Atlantic slope before the beginning of the present century. Mr. E. A. Samuels (1870) considered it "an extremely rare summer visitor in New England, Massachusetts apparently being its northern limit." Dr. Witmer Stone says that "up to 1860, and locally later, the bird was of regular occurrence on the Atlantic coastal plain, but during the next twenty years it practically disappeared from this region, and now is restricted to the Mississippi Valley, except in the case of occasional stragglers."[14] This well summarizes the case. The cause of its disappearance here must be left to conjecture, but similar disappearances of the species in other parts of the country have been followed by reappearances, and the time may come when these birds will be common again on the Atlantic coast.

HAUNTS AND HABITS. In the spring of 1873, if I mistake not the date, I was roaming over a hill pasture near Worcester, Massachusetts, one bright morning, in my hands a sawed-off Belgian musket containing a small charge of powder and dust shot, when I

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[1] Grant, E. O.: *in litt.* [2] Auk, Vol. XXXVI, 1919, p. 288. [3] Birds of Essex County, Massachusetts, 1905, p. 275.
[4] *Ibid.* [5] Willis, Miss Clara L.: *in litt.*
[6] Murray, J. K.: *in litt.* [7] Bicknell, E. P.: *in litt.*
[8] Foster, Francis A.: *in litt.* [9] Auk, Vol. XLIII, 1926, pp. 246, 247.
[10] Auk, Vol. VI, 1889, p. 194. [11] Dickens, Miss Elizabeth: *in litt.*
[12] Childs, Henry E.: *in litt.* [13] Reynolds, William J.: *in litt.*
[14] Stone, Witmer: Annual Report, New Jersey State Museum, Part II, Birds of New Jersey, 1908, p. 247.

heard a bird-song new to me. The little singer sat upon the top of a tall mullein stalk and sang his metallic notes for all the world to hear. Having listened to his simple lay and marked it well, I saw that he had a bright yellow breast and a black, somewhat crescentic, patch upon it, and I knew him at once for a male Dickcissel (for I had handled specimens of the bird in the museum), and, being in quest of rare specimens, thought to take him home. But the bird had other plans, and before the lumbering, clumsy piece could be brought to bear, he was off and away to the south at express speed before the wind. High he went and far before he faded from my sight and vanished in the dim and hazy distance. Many a time thereafter I lugged that old musket to that hill pasture, but I have not seen that bird since. So there is one record of the Dickcissel in Massachusetts that failed of substantiation.

Mr. Robert Ridgway writes as follows of this bird in Illinois: "While some other birds are equally numerous, there are few that announce their presence as persistently as this species. All day long, in spring and summer, the males, sometimes to the number of a dozen or more for each meadow of considerable extent, perch upon the summits of tall weed-stalks or fence-stakes, at short intervals crying out: '*See, see,* — *Dick, Dick-Cissel, Cissel;*' therefore 'Dick Cissel' is well known to every farmer's boy as well as to all who visit the country during the season of clover-blooms and wild roses, when 'Dame Nature' is in her most joyous mood.

"Perhaps the prevalent popular name of this species is 'Little Field Lark' or 'Little Meadow Lark,' a name suggested by his yellow breast and black jugular spot, which recall strongly the similar markings of the *Sturnella*, and also the fact that the two frequent similar localities. The name 'Black-throated Bunting' is probably never heard except from those who have learned it from the books.

"The location of the nest varies much with locality, though probably not more than in the case of many other species. At Mount Carmel, all that I found were in clover fields, and built upon or very close to the ground. In Richland county they were almost invariably built in small clumps of coarse weeds, at a height of about a foot above the ground. In Wisconsin, however, according to Dr. Brewer (Hist. N. Am. B. Vol. II, p. 68), Dr. P. R. Hoy, of Racine has never found a nest within one foot of the ground, some of them being as elevated as six feet. Of nineteen nests discovered by Dr. Hoy during one season, 'ten were built in gooseberry bushes, four on thorn bushes, three among blackberry bushes, one on a raspberry bush, and one on a wild rose.'" [1]

Economic Status. The Dickcissel feeds on many important insect pests and destroys comparatively little grain, but many weed seeds. It is generally regarded as a useful bird. Dr. Alfred O. Gross, who has made the most thorough study of this species yet published,[2] makes a very ingenious calculation of the sum saved daily to the farmers of Illinois (where the bird is abundant) by the destruction of grasshoppers. Estimating more than a million Dickcissels as summer residents there, that about 200 grasshoppers

[1] Ridgway, Robert: Ornithology of Illinois, Vol. 1, 1889, pp. 303, 304.
[2] Auk, Vol. XXXVIII, 1921, pp. 1-26 and 163-184.

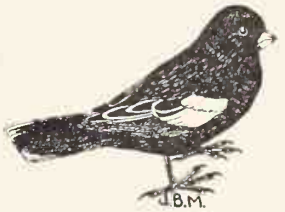
are eaten daily by each Dickcissel family, and that each grasshopper eats about one and a half times its own weight daily, he arrives at the conclusion that this bird saves the farmers of that great state about $4,680.00 per day in the nesting season.*

Calamospíza melanócorys Stejneger. Lark Bunting.

Other names: WHITE-WINGED BLACKBIRD; WHITE-WINGS; PRAIRIE BOBOLINK.

Contributed by Dr. John B. May.

Description. — Bill much like Blue Grosbeak, conic, swollen, deep at base, ridges slightly curved; wing long, pointed, tertials much elongated; tail shorter than wing, nearly even; legs and feet rather short and stout. *Adult male in breeding plumage:* Chiefly black, graying slightly on back; middle and greater wing-coverts mostly white; edges and tips of flight-feathers, outer tail-feathers and upper and lower tail-coverts white (which mostly wears off in summer); all except middle tail-feathers sometimes have large white spot at end of inner web; "bill dusky above, pale bluish-gray below" (R. Hoffmann); bill above and tip below bluish-horn-color; iris brown; legs and feet brown. *Adult male in winter plumage:* Similar to adult female in breeding plumage, but feathers below black with light tips, the black showing when plumage is disarranged; flight-feathers black as in summer, except tertials which are brown as in female. *Young male in first breeding plumage:* As adult male, except flight-feathers, which are more worn and brown. *Young male in first winter plumage:* Usually like adult female in winter plumage, but some precocious birds resemble adult male. *Adult female in breeding plumage:* Grayish-brown above, streaked dusky, brown wings with white patch as in male, but this patch smaller (often interrupted) and tinged buffy; below, white or whitish, tinged brown on sides of breast, sides and flanks, and streaked dusky on all three; flight-feathers and tail-feathers browner and duller than in male, but somewhat similarly marked, and light edges of tertials not white but brown, streaked dusky. *Adult female in winter plumage:* Like female in summer, but brown less grayish, and paler markings more buffy. *Young in juvenal plumage:* Similar to adult female, but somewhat more buffy.



Lark Bunting, Male in Summer.

Measurements. — Length 5.25 to 7.50 in.; spread 10.00 to 11.50; folded wing 3.25 to 3.60; tail 2.50 to 3.35; bill .50 to .60; tarsus .90 to 1.00. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt, first winter plumage by partial postjuvenal molt (late July, August) involving body feathers and wing-coverts; first breeding plumage by partial prenuptial molt (April) involving body plumage, wing-coverts and tertials; adult winter plumage by complete postnuptial molt (July to September); adult breeding plumage by partial prenuptial molt involving most of body plumage as in young bird.

Field Marks. — Size of White-throated Sparrow but with longer body and shorter tail. Adult male in summer, a striking black bird with large white patch on wing. Male in winter, female and young, are grayish-brown sparrow-like birds with a conspicuous white or creamy patch on wing similar to that in summer male, and with lightly streaked breasts.

Voice. — Notes like those of Yellow-breasted Chat (J. A. Allen); a low melodious whistle; a ringing *chink* like Bobolink (N. S. Goss); a soft, sweet *hoo-ee*, uttered with a rising inflection (G. F. Simmons); song *weet-weet-wt-wt-wt;* a sweet song between the hurried notes of the Bobolink and those of the Skylark (T. Nuttall); "sweet notes and trills, often interspersed with harsh notes" (R. Hoffmann).

Breeding. — On plains and prairies. *Nest:* On ground, sometimes slightly elevated but more often sunken; composed of grasses, fine roots, etc., lined with finer grasses, plant down or hair. *Eggs:*

* For a further study of the food of this bird, see United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 89-92, by Dr. S. D. Judd.

4 or 5; .80 to .95 by .65 to .70 in.; approaching rounded oval; light greenish-blue, like those of Bluebird, rarely lightly sprinkled with reddish-brown spots. *Dates:* June 1 to July 5, Colorado. *Incubation:* By female. One or two broods yearly.

Range. — Great Plains of central North America to northern Mexico. Breeds in Transition and Upper Sonoran zones from southern Alberta, southern Saskatchewan and southwestern Manitoba, south to northwestern New Mexico and northwestern Texas, east to central Kansas, eastern Nebraska and western Minnesota and west to the Rocky Mountains (central Colorado, western Wyoming and western Montana); winters from southern California, southern Arizona and central Texas south to Lower California, Guanajuato and Zacatecas (central Mexico); occasional in migration west to British Columbia and Nevada and east to western Iowa and southeastern Minnesota; accidental in Ontario, New York, Massachusetts and South Carolina.

Distribution in New England. — Accidental visitor. Records: *Massachusetts:* Lynn, December 5, 1877, a male shot by N. A. Vickary, now in collection Boston Society of Natural History;[1] Marshfield, June 9, 1907, adult male seen by Dr. John B. May;[2] Revere, March 10, 1917, immature female seen by C. J. Maynard and others;[3] Newton (Waban), January 5, 1919, one seen by Mrs. H. C. Dunham;[4] West Bridgewater, May 23, 1925, pair seen by Mrs. E. Louise Hathaway.[5]

Season in Massachusetts. — January 5, March 10, May 23, June 9, December 5.

Haunts and Habits. The afternoon of June 9, 1907, was a fine sunny Sabbath as my wife and I drove along the country road leading from Duxbury, Massachusetts, to the part of Marshfield known as Green Harbor. Just after we had crossed the "Dyke Meadow Bridge" and were nearing the sea-shore, my attention was attracted to an unknown bird which was feeding by the roadside with a small flock of House Sparrows. My first thought was that it was a partial albino Red-winged Blackbird or a freak Bobolink. The bird was quite tame and allowed a prolonged observation, with glasses, at the width of a country road, and we were able not only to take note of all the plumage markings but to see the shape of the bill very clearly, so that the bird was recognized as a finch of some kind. The bird was feeding avidly upon the seeds of wayside dandelions, which it procured by jumping up from the ground and nipping, with its powerful beak, through the base of the ripening flower heads, each time alighting with a beakful of white pappus. After we had watched it for some time, during which it was frequently interrupted by passing carriages and autos, it flew off across the grassy meadows and disappeared behind a knoll. It was an adult male Lark Bunting in full breeding plumage.

The Lark Bunting is a characteristic bird of the great western plains, a mere straggler to the Atlantic sea-coast. When the birds first arrive on their breeding grounds from their southern wintering places, the flocks of black and white males form a striking and pleasing addition to the open grassy or weed-grown stretches of prairie land. There is much twittering and cheery warbling as the birds select their mates from the dull-colored females and the courtship is soon culminated. Much of the singing is done while on the wing, the male birds rising obliquely "with a tremulous fluttering motion of the

[1] Allen, J. A.: Bulletin, Nuttall Ornithological Club, Vol. III, 1878, p. 48.
[2] Bird-Lore, Vol. XIV, 1912, p. 226.
[3] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. IX, 1917, p. 45.
[4] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. XI, 1919, p. 19.
[5] Hathaway, Mrs. E. Louise: *in litt.*

wings" from a lowly perch on a prairie weed, to perhaps fifteen feet in air, hovering a moment on rapidly beating pinions, then descending again to the ground, all the time giving utterance to a sweet and lively, modulated warbling.

At the end of the mating and nesting season the male quickly becomes a quiet, sparrow-like, dull-colored imitation of his modest mate, very much as the Bobolink changes at the same season. And like the Bobolinks, the Buntings now gather in good-sized flocks, feeding together in grassy places, weed patches or grain fields, the entire flock often rising and wheeling in unison, to alight again like a well-trained battalion. They are birds of strong flight and will often struggle against a gale which forces other birds to seek shelter.

Much of the food of the Lark Bunting consists of grass seeds, grain and weed seeds. About 78 per cent of its animal food is formed of grasshoppers, and it also eats many leaf-beetles and weevils, but its food habits have not been studied very exhaustively.

Economic Status. This species does some harm to growing grain in certain regions, but its destruction of grasshoppers and other injurious insects, and of seeds of weed pests like Russian thistles, pigweed and amaranth, probably outweighs this slight damage.

Family **TANGARIDÆ**. Tanagers.

Number of species in North America 4 ; in Massachusetts 3.

This is a large family of brilliantly plumaged birds, confined to the two American continents, and best represented in tropical regions. There are more than 300 species. They bear a superficial resemblance to the finches, but the bill usually is slightly more elongated and rather swollen, and the upper mandible often toothed or lobed near its middle, notched and slightly hooked at its tip, and the base of the lower mandible is never abruptly bent at an angle, as in the finches. In the principal North American genus, *Piranga*, to which our New England Tanagers are assigned, the toothing and notching of the mandible are often not noticeable, and sometimes almost imperceptible.

Piránga ludoviciána (Wilson). **Western Tanager.**

Plate 75.

Description. — Bill rather stout, shorter than head, elongated conic with curved ridge, slightly swollen, some sparse short bristles at base, and upper mandible slightly toothed near center of cutting edge; nostrils basal, naked; wings long and pointed, 2nd and 3rd primaries nearly equal in length; tail shorter than wings, slightly forked; legs and feet medium in size. *Adult male in breeding plumage:* Back, scapulars, wings and tail black, back sometimes shows a little yellow; last row of lesser wing-coverts, middle wing-coverts, tips of outer webs of greater coverts, edges of tertials, rump, upper tail-coverts, hind neck, lower plumage of body, and wing linings lemon to canary-yellow, usually lighter on wing linings, and paler (sometimes whitish) on tips of greater wing-coverts and tertials; head (at least the

fore part) red all around, darkest on top of head where sometimes nearly crimson, lightest on throat; back of neck also sometimes tinged red; bill dull yellow; iris brown; legs and feet bluish-gray. *Adult male in winter plumage:* Similar to male in breeding plumage, but head yellow or slightly tinged red, obscured behind with olive-greenish or dusky tips; feathers of back usually margined more or less with yellowish-olive; tertials broadly margined towards ends with pale yellowish or white, and tail-feathers margined white at tips. *Immature male in first breeding plumage:* Similar to adult male in summer, but duller; flight-feathers browner and more worn; a few olive feathers sometimes persist on sides and flanks and more rarely on back. *Young male in first winter plumage:* Like adult female, but brighter yellow below. *Adult female:* Above greenish-olive, darker and shaded grayish on back and scapulars, brighter on crown and rump; wings and tail grayish-dusky, their feathers mostly edged greenish-olive; middle wing-coverts broadly tipped light yellowish, and greater coverts edged and tipped yellowish or whitish, these tips forming two light wing-bars as in male, and tertials also with pale edges and tips; below variable, dull yellow, becoming clear lemon or canary-yellow on under tail-coverts. *Young female in first winter plumage:* Like adult female but coloration much duller; more brownish-olive above, and similar tint obscures lower plumage; wing-bars narrower and "pale yellowish-buff." *Young in juvenal plumage:* Similar to adult female; obscurely streaked above and streaked dusky below; throat and upper breast pale grayish.

Measurements. — Length 6.75 to 7.50 in.; spread 11.00 to 12.00; folded wing 3.50 to 4.00; tail 2.75 to 3.75; bill .60 to .68; tarsus .73 to .77. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (July to September) involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (April, May) involving body plumage, wing-coverts, tertials and tail; adult winter plumage by complete postnuptial molt (August, September); adults have complete postnuptial molt (August, September) and partial prenuptial molt of body feathers in spring.

Field Marks. — Near Bluebird size. *Adult male:* Head red; back, wings and tail black; rest of plumage yellow; two pale yellow or whitish wing-bars. *Female and young:* Resemble those of Scarlet Tanager, but distinguished by *two yellowish wing-bars as in male Western Tanager.*

Voice. — Song resembling that of Scarlet Tanager, but alarm note quite different; usual note *plit-it* (T. M. Brewer); call note a drawling *chĕr′-tig, chēē′-tik* or *prĭt′-it,* frequently repeated; song a hoarse drawling *chĕr′-wĕr,* repeated rather rapidly from three to many times (Grinnell and Storer).

Breeding. — In open parts of forest. *Nest:* Usually near end of horizontal branch of pine tree, from 20 to 60 feet from ground; a rather loose and open fabric of rootlets, pine leaves and grasses, often lined with hair in northern localities. *Eggs:* 3 or 4; about .91 to .96 by .65 to .68 in.; closely resembling those of Scarlet Tanager (see page 130). *Dates:* Late May or early June, California; June 15, Colorado; June 25, Oregon. *Incubation:* By female.

Range. — Western North America and Central America. Breeds in Canadian and Transition zones from southeastern Alaska, northern British Columbia, southwestern Mackenzie and southwestern South Dakota south to southern Lower California, southern Arizona, central-western Texas and casually in Wisconsin; occasional in migration east to Kansas; winters from southern Tamaulipas and Hidalgo (Mexico) to Guatemala; casual in Maine, Massachusetts, Connecticut, New York and Louisiana.

Distribution in New England. — Accidental straggler. Records: *Maine:* Bangor, about October 1, 1889, an adult male taken, identified by Manly Hardy; collector's name not given.[1] *Massachusetts:* Lynn, January 20, 1878, adult female captured alive during a violent snowstorm, according to T. M. Brewer (Howe and Allen record this specimen as taken at Salem);[2] Brookline, December 19, 1919, adult female found dying, specimen now in collection Boston Society of Natural History;[3] Leverett, June 12, 1921, adult male seen by Miss Ethel M. Smith;[4] Springfield, August 13, 1926, adult male

[1] Knight, Ora W.: A List of the Birds of Maine, 1897, p. 104.

[2] Brewer, T. M.: Forest and Stream, Vol. X, 1878, p. 95, and Howe and Allen: Birds of Massachusetts, 1901, p. 113.

[3] Bangs, Outram: Auk, Vol. XXXVII, 1920, p. 301.

[4] Bird-Lore, Vol. XXIII, 1921, p. 199.

PLATE 75

PLATE 75

SUMMER TANAGER
Page 133

MALE

FEMALE

SCARLET TANAGER
Page 129

WESTERN TANAGER
Page 127

FEMALE

MALE

MALE IN SUMMER

MALE IN WINTER

Allan Brooks.

reported by Mrs. Edna M. Ingalls;[1] Essex, August, 1927, young male seen by Horace Taylor (exact date not given).[2]

Season in Massachusetts. — June 12 to August (winter).

Haunts and Habits. The Western Tanager is a handsome, showy bird, given to singing from the tree-tops along the edge of great forests, or in rather open forest glades. It was discovered in Idaho during the memorable expedition of Lewis and Clarke in 1808. It was named the Louisiana Tanager because it was a native of that great and formerly unexplored land beyond the Mississippi then known as Louisiana, but today the name Western Tanager is much more appropriate, for it is a typical western bird. When, on first visiting the Pacific coast, I heard the song of this striking bird, it seemed almost exactly to duplicate the well-known strident, hoarse carol of the Scarlet Tanager of the eastern United States, and it has the same ventriloquial quality, so that often it is difficult to locate the direction of the singer. However, his habit of singing at the very top of tall trees gives the observer every opportunity when once the bird is located. The female is inconspicuous, and the nest so well hidden that it is seldom found.

This bird feeds largely on insects, which it takes from the foliage or pursues through the air in the manner of a flycatcher.

Economic Status. As a forest bird the Western Tanager is, doubtless, serviceable in the destruction of forest pests. It feeds upon destructive beetles, whose wood-boring larvæ are among the greatest enemies of forest trees. But the bird is also destructive to small fruits and so has incurred the enmity of California fruit growers.

Piranga erythrómelas Vieillot. **Scarlet Tanager.**

Other names: black-winged red bird; fire bird.

Plate 75.

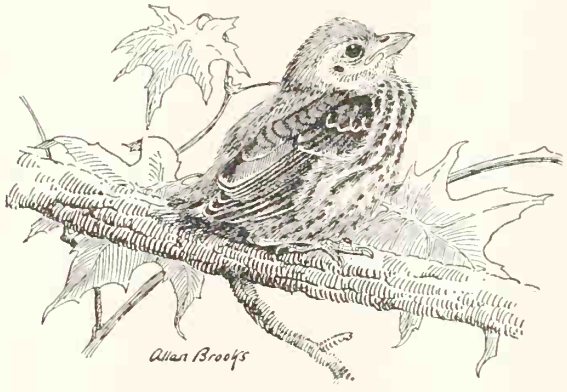
Description. — Formed much like the Western Tanager, but outlines of head and bill more graceful, and entirely different in color. *Adult male in breeding plumage:* Plain bright scarlet or scarlet-vermilion; scapulars, wings and tail glossy black, some show scarlet feathers in middle wing-coverts, forming an interrupted wing-bar; wing linings white, margined black, some have the white tinged scarlet; bill bronzy-olive or yellowish-green; iris brown; legs and feet bluish-gray or grayish-blue, tinged with lavender. *Adult male in winter plumage:* Above yellowish-olive-green, more yellowish on top of head; wings and tail black as in summer; below, gamboge-yellow shaded olive-green on sides and flanks. *Young male in first breeding plumage:* Variable; some are red with black wing-coverts and tertials, and faded worn brown primaries and secondaries; some have a few greenish feathers among the red; some have some red wing-coverts; some have orange or orange-yellow in place of scarlet. *Young male in first winter plumage:* Similar to adult female, but usually not so yellow, somewhat tinged reddish or orange; wing-coverts and scapulars black. *Adult female:* Resembles adult male in winter but duller, more grayish on back; wings and tail not black but dusky-brownish-gray with some olive-greenish feather-edgings; below dull light yellow, brightening to canary-yellow on under tail-coverts; wing linings grayish-white (sometimes tinged pale yellow) and broadly margined outwardly with olive-greenish or grayish. *Young female in first winter plumage:* Similar to young male in winter, but duller and greener, and without black

[1] Ingalls, Mrs. Edna M.: *in litt.* [2] Taylor, Horace: *in litt.*

wing-coverts or scapulars. *Young in juvenal plumage:* Ruddy or yellowish above, tinged deep brownish and faintly streaked darker; wings deep olive-brown with greenish feather-margins; tail olive-green or olive-yellowish; below dull whitish, tinged yellow posteriorly, and broadly streaked on throat, breast, sides and flanks with dark olive-brown; "bill and feet pinkish-buff, becoming dusky-clay-color, the feet darker" (J. Dwight).

Measurements. — Length 6.50 to 7.50 in.; spread 11.00 to 12.00; folded wing 3.50 to 4.00; tail 2.70 to 3.25; bill .46 to .62; tarsus .71 to .77. Female smaller than male.

Molts. — Juvenal plumage acquired by complete molt of natal down; first winter plumage by partial prenuptial molt (July to October) involving body plumage and wing-coverts; first breeding plumage by partial molt (April, May) involving body plumage, wing-coverts, tertials and tail (sometimes only part of tail); adult winter plumage by complete postnuptial molt (August, September); adult breeding plumage by partial prenuptial molt of same areas as in first prenuptial molt; probably at least another year required to assume highest plumage; adults have partial prenuptial molt in spring and complete postnuptial molt (late July to October); males during this molt show patches of green mixed with the red.



Scarlet Tanager, Juvenile.

Voice. — Alarm note, a strident call, often represented as *chip-churr;* a sharp *chip,* and there are other softer notes; song a slightly hoarse carol of somewhat similar tempo to that of the Robin; has been written *chī, chī, chare'e-chī;* some males have a longer song, as given by T. G. Gentry, *chī-chī-chī-c har-ēē, char-ēē chī.*

Breeding. — In high open woods, oaks preferred, sometimes in pines, in low thick woods, or in old orchards. *Nest:* Placed near end of horizontal branch, 6 to 50 feet from ground, usually 20 feet or more; a rather large, flat, thin structure of twigs, fine bark-strips or weed stems, grasses, etc., lined with fine rootlets; often so loosely built that eggs may be seen from below. *Eggs:* 3 to 5; .85 to 1.02 by .62 to .70 in.; ovate to rounded ovate; light or pale greenish-blue, with many spots of various shades of brown, the greater number usually clustered about large end, closely resembling those of Rose-breasted Grosbeak; figured by E. A. Capen in "Oölogy of New England," Plate VI, Figs. 6, 7. *Dates:* May 22 to June 3, Rhode Island; June 2 to June 17, Massachusetts. *Incubation:* Period 13 days (F. L. Burns); by female. One brood yearly. (See Fig. 75.)

Range. — Eastern North America north to the Canadian Zone, eastern Central America, and northern South America. Breeds chiefly in Transition and Upper Austral zones from southeastern Saskatchewan, southwestern Manitoba, northern Minnesota, Wisconsin, northern Michigan, south-central Ontario, southern Quebec, New Brunswick and Nova Scotia south to southeastern Oklahoma, central Arkansas, Tennessee and in mountains of northern Alabama, northern Georgia, northwestern South Carolina and Virginia; winters from Colombia and Bolivia to Peru; casual in migration in southern Alberta, Wyoming, Colorado, Bahamas and Lesser Antilles.

Distribution in New England. — *Maine:* Rare migrant; rare summer resident. *New Hampshire:* Common migrant; not uncommon summer resident up to about 2,200 feet in White Mountains and southward, more rare northward. *Vermont:* Common migrant; common summer resident up to about 2,500 feet. *Massachusetts, Rhode Island and Connecticut:* Common migrant; common summer resident.

Season in Massachusetts. — (April 18, 21, 30) May 4 to October 16.

Haunts and Habits. The Scarlet Tanager is one of the most gorgeous of New England birds. Its encrimsoned body and sable wings and tail stand out in strong relief against the greenery of tender May-time foliage. This striking bird has been the inspiration of many a facile pen. Mrs. Florence Merriam Bailey says of it: "High among the tree tops of the cool green woods the Tanager sings through the summer days. Hidden by the network of leaves above us we often pass him by; but once discovered he seems to illuminate the forest. We marvel at his color. He is like a Bird of Paradise in our northern landscape."

Here is a common bird that passes most of his life in the woods, hidden by the foliage where he is seldom seen by the uninitiated, who look upon him as a *rara avis*, and count it a red-letter day when once they glimpse the brilliant bird. His consummate ventriloquism adds to the difficulty of the search. The novice hears the song apparently far away, when in reality the bird may be just overhead, but concealed by dense foliage. He may be located, however, by going past the sound and then returning to it, and when the elusive singer is once discovered the sight of his scarlet vesture is well worth the trouble. This bird has the distinction of being the first among the feathered races to fix the attention of that brilliant ornithologist, Dr. Elliott Coues, who says: "I hold this bird in particular, almost superstitious, recollection, as the very first of all the feathered tribe to stir within me those emotions that have never ceased to stimulate and gratify my love for birds. More years have passed than I care to remember since a little child was strolling through an orchard one bright morning in June, filled with mute wonder at beauties felt, but neither questioned nor understood. A shout from an older companion — 'There goes a Scarlet Tanager!' — and the child was straining eager, wistful eyes after something that had flashed upon his senses for a moment as if from another world, it seemed so bright, so beautiful, so strange. 'What is a Scarlet Tanager?' mused the child, whose consciousness had flown with the wonderful apparition on wings of ecstasy; but the bees hummed on, the scent of the flowers floated by, the sunbeam passed across the greensward, and there was no reply — nothing but the echo of a mute appeal to Nature, stirring the very depths with an inward thrill. That night the vision came again in dreamland, where the strangest things are truest and known the best; the child was startled by a ball of fire, and fanned to rest again by a sable wing. The wax was soft then, and the impress grew indelible. Nor would I blur it if I could — not though the flight of years has borne sad answers to reiterated questionings — not though the wings of hope are tipped with lead and brush the very earth, instead of soaring in scented sunlight." [1]

In my own earliest childhood the Scarlet Tanager was a bird of which I dreamed, but which I never saw. However, as soon as I became familiar with its note, I found it a common woodland sound. There was a wood of giant white oaks in southern Worcester County, and there during the spring migration the trees were peopled with the scarlet

[1] Coues, Elliott: Department of the Interior, United States Geological Survey, Miscellaneous Publications, No. 11, Birds of the Colorado Valley, Part First, 1878, p. 352.

males, all in full song. That grove became the destination of an annual spring pilgrimage. It has vanished long since with all the other big timber of the region, but every year the Tanagers appear in the coppice growth that succeeded the old trees. They prefer white oak woods, but may be found anywhere in deciduous woods, and in mixed growths, especially in a well-watered country.

We see few Scarlet Tanagers in New England until the foliage develops somewhat upon deciduous trees, and most of them do not arrive until the leaves are large enough to afford them some measure of concealment. They are warm weather birds, fond of sunshine, though often somewhat oppressed by an excessively hot sultry atmosphere. June 24, 1904, was an extremely hot, humid day at Concord, Massachusetts, and as I moved along a woodland path, the more tender plants were beginning to droop with folded hanging leaves and wild strawberries were drying on the stem. Thunder clouds were rolling up in the north, and a distant rumbling warned me to hasten toward the shelter afforded by the cabin on the river. As I passed hurriedly along, a beautiful Scarlet Tanager flew up from beside the path and alighted a few feet away. His bill was wide open as he panted, almost gasping for breath. He reached forward, picked an insect off an oak twig, flew along a few feet, fluttered over an oak leaf, and took another insect from that, all the while panting violently. In hot weather the males of this species often may be seen with the wings drooping and tail cocked up, which gives them a jaunty appearance. This posture is exaggerated during courtship by dragging the wings and fluffing up the scarlet plumage, which may add to his attractiveness in the eyes of his expectant consort.

The female apparently attends to the duties of nest building and incubation. But she is not lonely, for while the male does not assist her, his part of the domestic duties at this time consists of furnishing the entertainment; so from the next tree or from some near-by tree-top, he cheers her with call and song, and always stands ready to repel an enemy. His concealment among the leaves, together with his ventriloquial powers, must serve him well, for I have seldom found remains indicating the demise of one of these male birds by the talons of a hawk.

As soon as the young are hatched, the male takes an active part in their upbringing, and feeds them almost as assiduously as does the female. Apparently some males can hardly wait for their own young to appear before beginning to do their part in furnishing nourishment. Mr. Henry Hales of Ridgewood, New Jersey, tells of one that spied a nest of Chipping Sparrows, whose young hatched before his own appeared, and who began feeding them, much to the disquiet of their own parents, who, meanwhile, hovered about with food in their mouths which the little ones were too full to take, having been very liberally fed by their foster father, who continued to feed them for several days. When his own precious brood broke the shell, however, he left the young Chippies to the care of their rightful parents, and paid as faithful attention to his own family.[1]

This species does not sing so often nor so regularly as the Indigo Bunting or the

[1] Auk, Vol. XIII, 1896, pp. 261–263.

Red-eyed Vireo, but when one is silent and hidden it may be startled into song by a sudden shout or by a noisy vehicle coming along the road, or if it fails to sing it may give a sharp *chip* or *chip-chúrr*, which may betray its location.

Most of the motions of the Scarlet Tanager are leisurely, except in love or war, but in case of necessity it can move very fast. Mr. A. C. Bagg says that he saw one drop a red berry from its bill and recover it before it had fallen eight inches. While not particularly active as a flycatcher, it is a premier caterpillar hunter. It destroys not only hairless larvæ of many species, but also such hairy ones as those of the gipsy moth and the forest tent caterpillar as well. Once my attention was called to a bush partly defoliated by a swarm of the latter caterpillars. Soon a Scarlet Tanager alighted there, and continued to come and go until he had taken every caterpillar from that bush. This species destroys enormous numbers of tiny newly hatched caterpillars before the little pests have any opportunity to commit their depredations upon the foliage. The late F. H. Mosher, a very careful and trustworthy assistant, spent some time under my direction in watching birds that fed on these and other caterpillars. On May 18, 1898, he saw two Scarlet Tanagers eat newly hatched caterpillars of the gipsy moth for eighteen minutes at the average rate of thirty-five a minute. Assuming his observations to be accurate, these two birds must have disposed of about 630 of the tiny creatures in those eighteen minutes. But this bird does not confine its attentions to caterpillars alone; it eats their parents, the nocturnal moths. Even the giant *polyphemus* and the *luna* are not safe from its attacks. The larvæ of these species are very destructive to trees, where arboreal birds are lacking. Among the first class pests eaten by this tanager we find the Colorado potato beetle, many wood-boring beetles, bark beetles, leaf-eating and leaf-rolling beetles, click beetles, grasshoppers and locusts; it takes ants also, but destroys some useful ichneumon-flies and some spiders. It is said to take some wild berries and seeds, but insects seem to form its principal food while in New England.

Economic Status. Though the Scarlet Tanager eats some useful insects, the injurious species greatly predominate, and the bird is believed to be one of the most desirable species of orchard and woodland.

Piranga rúbra rubra (Linnæus). Summer Tanager.

Other names: CRIMSON TANAGER; SUMMER RED-BIRD.

Plate 75.

Description. — Formed much like Scarlet Tanager but bill a little heavier, with toothing obsolete. *Adult male (summer and winter)*: Plain red above and below; above, dark, dull, poppy-red or rosy-red (variable); below, largely vermilion; wings dark brownish-gray or dusky, most of their feathers edged and tipped red, but alula and primary-coverts not so tipped; wing linings and axillars somewhat lighter than other lower plumage; tail more red than wings; bill dusky on ridge, mostly olive-green or light brownish; iris brown; legs and feet grayish-blue. *Immature male in first breeding plumage:* Very variable; some almost entirely red except worn greenish wings; others show more or less red amidst olive-green and yellow body plumage. *Young male in first winter plumage:* Similar to adult female, but more

richly colored, some parts strongly tinged orange or reddish above and sometimes below; eye-ring usually yellow. *Young male in juvenal plumage:* Above, mostly olivaceous, streaked dusky; below, white or whitish, often more or less tinged buffy-yellowish and streaked dusky, except under tail-coverts, which are orange-buff, also streaked dusky; a yellow wing-bar, and outer web of primaries usually tinged orange or reddish. *Adult female:* Above olive-green, tinged with yellow (some are tinged with red), lightening a little on top of head, lower rump and upper tail-coverts; back and scapulars often tinged gray; wings and tail dusky-brownish-gray, the feathers edged light yellowish-olive-green; lores and ear region touched with gray; an inconspicuous yellow ring around eye; below dull yellow (corn-yellow); under tail-coverts slightly brighter yellow; (some have some touches of dull red, duller than in young male). *Young female in juvenal plumage:* Like young male in same plumage, but tail more olivaceous, and outer webs of primaries without reddish tinge.

Measurements. — Length 7.00 to 7.80 in.; spread 11.25 to 12.12; folded wing 3.45 to 3.95; tail 2.90 to 3.10; bill .65 to .80; tarsus .66 to .75. Female smaller than male.

Molts. — Differs from Scarlet Tanager or Western Tanager in having no spring or prenuptial molt in adult, and no great seasonal change in plumage after the first year; probably several years are required by male to reach highest plumage, and immature males vary much in color; juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (July, August) involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (very variable in its extent), involving part of body plumage, wing-coverts, tertials and tail; adult winter plumage acquired by complete postnuptial molt (August) and adult breeding plumage by wear.

Field Marks. — Size larger than Bluebird, smaller than Catbird. *Adult male:* Red practically all over, a rosy or bricky-red, unlike that of Scarlet Tanager. *Immature male:* Very variable, from color only a little brighter than female to a patchy red and green plumage. *Female:* Similar to female Scarlet Tanager, but darker and duller both above and below.

Voice. — Call note, *chicky-tucky-tuck* (N. S. Goss); or *pa-chip-it-tut-tut-tut* (T. M. Brewer); a call somewhat resembling the words *which-a-too* (T. G. Pearson); song, longer, louder and clearer than that of Scarlet Tanager, with a quality resembling that of an oriole or vireo.

Breeding. — In dry, rather open, upland woods; sometimes in villages, or thickly settled towns. *Nest:* Usually near end of horizontal limb, from 5 to 30 feet from ground; a thin, shallow but firm fabric of grass stems, leaves or bark-strips, etc. *Eggs:* 3 or 4; .85 to .95 by .68 to .75 in.; rounded ovate to oblong; bluish-green to bright emerald-green, spotted, blotched, marbled and mottled with purplish. brown or brownish-purple and dark brown of various shades. *Dates:* May 15 to June 10, Florida; May 20 to June 12, Virginia; May 12 to June 1, South Carolina; May 28, southern Illinois. *Incubation:* Period 12 days (A. R. Dugmore); by female. One brood yearly.

Range. — Eastern United States, Middle America and northern South America. Breeds in Carolinian and Austroriparian zones from southeastern Nebraska, southern Iowa, Illinois, southeastern Wisconsin, central Indiana, central Ohio (formerly southeastern Pennsylvania and New Jersey), Maryland and Delaware south to northeastern Mexico, southeastern Texas, southern Mississippi and central Florida and west to eastern Kansas and central Texas; winters from central Mexico and Yucatan to Ecuador, Peru, northwestern Brazil, Guiana and Trinidad; casual in the Bermuda Islands and north to Ontario, Quebec, New Brunswick, Maine and Nova Scotia; migrant in western Cuba; accidental in Bahamas, California and on Guadalupe Island (Lower California). There is a western race in the southwestern United States.

Distribution in New England. — Very rare or accidental visitor. Records: *Maine:* Wiscasset, bird taken some years previous to 1883, by Dr. S. B. Cushman, and identified by William Brewster;[1] Portland, May 18, 1905, one seen, according to Arthur H. Norton;[2] Holden, May 17, 1913, female taken, now in the possession of Mrs. Fannie H. Eckstorm;[3] Monhegan Island, October 20 and 21, 1918,

[1] Smith, Everett: Forest and Stream, Vol. XIX, 1883, p. 465, also Knight, Ora W.: Birds of Maine, 1908, p. 448.
[2] Journal, Maine Ornithological Society, Vol. VIII, 1906, p. 68. [3] Eckstorm, Mrs. Fannie H.: *in litt.*

a changing male seen on former date, a female on latter, both identified by Bertrand H. Wentworth.[1] *New Hampshire and Vermont:* Doubtfully recorded. *Massachusetts:* Framingham, immature male taken some years prior to 1870, by A. L. Babcock;[2] Lynn, April 21, 1852, two taken, according to S. Jillson, and recorded by F. W. Putnam;[3] Swampscott, June, 1866, bird taken;[4] Amherst, August, 1867, bird taken;[5] Watertown, about June 1, 1896, immature male taken by John Cullen, specimen in possession of Albert W. Perkins;[6] Beverly, April 23, 1916, bird appeared during a cold storm, soon died and was mounted, reported by Viola E. Crittenden.[7] Before and since that time there have been many reports of the species seen in the State but not taken. *Rhode Island:* Block Island, April 7, 1901, bird taken by Captain Edward P. Sisson, reported by Messrs. Angell and Cash;[8] Seaconnet Point, April 27, 1901, immature male shot by a fisherman and received by Messrs. Angell and Cash, now in the collection of the Boston Society of Natural History.[9] *Connecticut:* J. H. Linsley recorded the species from Stratford and New Haven;[10] Suffield, July 21, 1876, male taken by Erwin I. Shores;[11] Whitneyville, May 23, 1882, female taken by Dr. L. C. Sanford;[12] New Haven, April 8, 1886, male taken, and in collection of L. B. Bishop;[13] Portland, April 28, 1893, male, died of exposure;[14] Old Saybrook, April 27, 1895, male taken by J. N. Clark.[15]

[Note. Since Mr. Forbush prepared the above material, New England has experienced a remarkable visitation of this species. On April 17, 1929, Mr. Francis A. Foster telephoned me that a male Summer Tanager was visiting his feeding station on Marthas Vineyard, accompanied by an Indigo Bunting, the latter bird being nearly a month ahead of its usual date of arrival. On April 18, Mr. Everett R. Eldredge, Jr., of Chatham, reported a male Summer Tanager picked up dead in that town the preceding day. On April 18, Mr. Allan Keniston of Marthas Vineyard sent a female Summer Tanager and a male Scarlet Tanager to the Boston Society of Natural History and on April 20 he sent them a male Summer Tanager in transition plumage and wrote that another Red-bird had been reported at Nantucket. On April 20 my thirteen year old son Richard brought me a full-plumaged male Summer Tanager which he had picked up dead near our home in Cohasset. This latter bird had been dead perhaps two days. Since then I have received reports of about a dozen more Summer Tanagers, from southern Massachusetts. At least one Summer Tanager and three Scarlet Tanagers were reported in Maine between April 17 and 24, the former near Portland. All of these birds were undoubtedly brought to New England by the great storm which reached its height here on April 16, when a wind velocity of over 60 miles per hour was reported. This storm first appeared in Texas April 13, travelled east rather slowly to South Carolina, then swung northeast along the coast, reaching its greatest intensity between New Jersey and Massachusetts on April 16. Some dates of arrival of the Summer Tanager are given by Dr. H. C. Oberholser in Bird-Lore (Vol. XX, 1918, pp. 145, 146), as Charleston, South Carolina, April 13 and Raleigh, North Carolina, April 20, so it can be seen that migration was at its height in the southern states when this storm overtook the birds and carried them north to Massachusetts. J. B. M.]

Season in Massachusetts. — April 17 to August.

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[1] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. XI, 1919, p. 29.
[2] Allen, J. A.: American Naturalist, Vol. III, 1870, p. 578.
[3] Proceedings, Essex Institute, Vol. I, 1856, p. 224.
[4] Allen, J. A.: Bulletin, Essex Institute, Vol. X, 1878, p. 15.
[5] Stearns, W. A., and Coues, Elliott: New England Bird Life, Vol. I, 1881, p. 179.
[6] Brewster, William: Birds of the Cambridge Region, 1906, p. 298.
[7] Townsend, C. W.: Supplement, Birds of Essex County, Massachusetts, 1920, p. 151.
[8] Angell and Cash: *in litt.*
[9] Allen, Glover M.: Auk, Vol. XXV, 1908, p. 235.
[10] Sage, Bishop and Bliss: Birds of Connecticut, 1913, p. 138.
[11] Merriam, C. Hart: Review of the Birds of Connecticut, 1877, p. 28.
[12] Sage, Bishop and Bliss: Birds of Connecticut, 1913, p. 138.
[13] *Ibid.*
[14] Sage, Jno. H.: Auk, Vol. X, 1893, p. 303.
[15] Auk, Vol. XII, 1895, p. 306.

PLATE 76

CLIFF SWALLOW

Page 143

Adult Male

Juvenal Male

BARN SWALLOW

Page 148

Juvenal Female

Adult Male

Juvenal

PURPLE MARTIN

Page 137

Adult Male

Adult Female

Allan Brooks.

suckers and swifts, however, is, as Coues says, one of "analogy, not of affinity," for their relationships are plainly *Oscine*. The tarsal envelope is scaled in front and laminate behind, the plumage is soft, smooth and blended, and usually glossy or even iridescent.

There are about 100 species distributed throughout the world, all insectivorous, but some can subsist on berries or seeds in extremity. Some species nest in holes in the ground or in trees or cliffs, etc. Others build nests of mud or clay, lined with warmer material. Many small birds migrate at night, but swallows travel chiefly or wholly by day, and so far as possible avoid crossing great bodies of water. They are emphatically "fowls of the air," as a large part of their time is passed in flight, during which they capture flying insects.

Economic Status. Swallows commonly flit about over grasslands, where they catch and eat many insect pests of the grass, and as the grass crop is the greatest crop in the world, swallows are regarded as very beneficial, though they destroy some useful insects.

Prógne súbis subis (Linnæus). Purple Martin.

Other names: BLACK MARTIN; HOUSE MARTIN; MARTIN.

Plate 76.

Description. — Bill very short, stout and broad at base, upper mandible distinctly hooked at tip, its ridge quite convex; nostrils opening directly upward; head very broad; wings very long and pointed, extending beyond tip of rather long, not very deeply forked, tail; feet with strong, curved claws. *Adult male:* Dark glossy steel-blue, often with violet reflections; lesser and middle wing-coverts with dusky centers; rest of wings, and tail dull or sooty-black. *Adult female, young of both sexes in first winter and in first nuptial plumage:* Steel-blue of upper plumage duller than in adult male, and broken by sooty-gray; chin, throat, breast and sides pale gray, the feathers, especially on upper breast, with darker (sooty-gray) centers; lower breast, abdomen and under tail-coverts white or whitish, mostly with dark shaft-lines; a narrow white patch on side under wing; leg-feathering grayish; iris brown; bill, legs and feet black. *Young male in juvenal plumage:* Like adult female, but forehead more grayish. *Young female in juvenal plumage:* Like juvenal male, but whole top of head gray.

Measurements. — Length 7.25 to 8.50 in.; spread 15.50 to 16.75; folded wing 5.50 to 6.20; tail 2.75 to 3.50 (forked for .70 to .90); bill .45 to .55; tarsus. 45 to .61. Female somewhat smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by a probably complete postjuvenal molt after birds leave on their southern migration; first breeding plumage apparently by wear; adult winter plumage by complete postnuptial molt after birds leave their northern homes; adults have but one (complete) postnuptial molt.

Field Marks. — Size, largest of our swallows. *Male:* A very large, dark, steel-blue swallow, with tail forked but not very deeply, appearing black at a distance. *Female and young:* Similar in size, but not so dark, mottled gray and whitish on chin, throat and breast; middle of belly and under tail-coverts whitish.

Voice. — Ordinary notes "deep, musical *perro, perro, perro*" (Wilson); also a "loud, rich chirrupping," a "harsh squeak," and some low guttural notes; alarm note *kerp*, somewhat like call of Evening Grosbeak; a whistled *koo-kee-koo*, or when given in two syllables much like *bo-peep'*; "a low-toned *kroop*"; song, "several throaty notes followed by a spluttering trill" (W. M. Tyler).

Breeding. — Usually in open country, not far from water; never in deep forest. *Nest:* In hole in tree or cliff, in some cavity about a building, or in bird houses, etc., put up for its convenience; loosely built of twigs, grasses, feathers, fresh leaves, etc., with sometimes a little mud as a foundation. *Eggs:* 3 to 8, usually 4 or 5; .70 to 1.08 by .60 to .73 in.; long ovate; pure white; figured by E. A. Capen in "Oölogy of New England," Plate VII, Fig. 1. *Dates:* May 2 to May 23, South Carolina; May 3 to June 15, Virginia; May 30 to June 21, Massachusetts; June 5 to July 4, Maine. *Incubation:* Period variable; 12 to 13 days (F. L. Burns), 12 to 15 days (J. W. Jacobs), between 13 and 20 days (Otto Widmann); chiefly or wholly by female. One brood yearly in New England, possibly two sometimes in some parts of the southern states.

Range. — North America from lower Canadian Zone southward (except Pacific coast region), Central America and South America. Breeds chiefly in Austral zones from central Alberta, central Saskatchewan, southern Manitoba, northwestern Ontario, southern Quebec, New Brunswick, Prince Edward Island and Nova Scotia, south to the Gulf coast from Texas to southern Florida, and in Mexico to Vera Cruz, Jalisco and Nayarit, and west to Montana, Idaho and Arizona; occurs in migration in Venezuela; winters from British Guiana to Brazil; casual in Newfoundland; accidental in Bermudas and Ireland. A western race occupies the Pacific coast region.

Distribution in New England. — Not uncommon migrant; formerly common local summer resident in all the states; now uncommon, rare or wanting, or very local in most of southern New England, and local in northern New England; most common in eastern Maine and locally in its southern counties.

Season in Massachusetts. — (March 31) April 14 to September 30.

History. Formerly the Purple Martin was an abundant bird in New England. It was always local, however, and probably it was never an inhabitant of the great forests that covered so large a part of the country in aboriginal times. Then it must have been confined mostly to open, grassy valleys along the lower reaches of rivers, and to shores of lakes and possibly also to the vicinity of marshes along the sea-coast, where it nested in the abandoned habitations of woodpeckers.

The bird has been a favorite with mankind from time immemorial. The Indians were accustomed to trim up a few saplings about their crude dwellings and hang from the stub of each limb a gourd or calabash, hollowed for the convenience of their feathered visitors. Where saplings were not conveniently situated the Indians set up poles, fastened cross-bars to them and hung the gourds to these cross-bars. Later, the southern negroes followed their example.

The Purple Martin is believed to have been originally a bird of the tropics, which because of its fecundity and great powers of flight has become disseminated widely through the North Temperate Zone. Evidently it is a tender species which cannot withstand cold and wet, as long-continued, cold rain-storms have been known to nearly extirpate it from considerable areas. An occurrence of this kind is said to have taken place many years ago in eastern Massachusetts, where the species was nearly wiped out, and, as Dr. Brewer said, "to this day their places have never been supplied." [1] About 1864 Prof. John L. Russell of Salem, Massachusetts, wrote that the bird was then very rare in that vicinity, as a long, cold rain-storm had killed them by scores, and few were seen afterward.[2] I recorded a similar occurrence, which seriously affected swallows

[1] Baird, Brewer and Ridgway: A History of North American Birds, Land Birds, Vol. I, 1905, p. 331.

[2] United States Department of Agriculture, Annual Report, 1864, p. 354.

and other insect-eating birds, in June, 1903, destroying most of the Martins in Massachusetts and contiguous parts of New England.[1] A similar though lesser catastrophe occurred in late June and July, 1914.[2] These periodical depletions of the Martins were caused mainly by the destruction of flying insects, due to long, cold storms which swept the air clear of such insects as form the chief food of swallows and Martins. Lacking food to keep up the animal heat in their bodies and chilled by the cold, the Martins huddled together in their houses and starved, while waiting for clearing weather. When the sky cleared such of the weakened birds as were still able to fly came out, but were unable to find their accustomed food and died wherever they fell to the ground from weakness. Meantime all the young had died of starvation, as well as most of the adults, except perhaps a very few of the strongest and most resourceful survivors. In most localities where the precipitation was very heavy, there were no survivors, and only in those areas where comparatively little rain fell were there many. Since then at least two similar destructive stormy seasons have visited New England in nesting time, and although neither was so prolonged or severe as that of 1903, most of the young Martins perished. Even in the South similar occurrences have happened. Mr. Arthur T. Wayne tells us that on April 14 and 15, 1907, large numbers died during the prevalence of gales and cold.[3] Nevertheless, had storms been the only destructive factor, doubtless the prolific Martins would have increased rapidly in numbers and refilled their old houses, but before that could occur, their places were taken in most cases by that interloper, the European House Sparrow. In those cases where the few surviving Martins returned in the spring to their old homes, they found the houses filled with the rubbishy nests of the Sparrows. Often they were able to drive out the invaders and toss out their eggs and nests. But year by year the Sparrows grew more numerous and truculent, until finally they occupied and held nearly all the martin boxes in the region where the Martins had suffered from cold rain-storms. The people, finding the bird houses occupied by Sparrows, often lost interest and allowed the houses to decay or took them down, and when in recent years the number of House Sparrows began to decrease, that other European invader, the Starling, drove out the Sparrows and became an even more formidable enemy to the Martins. Therefore only a few colonies of Martins now survive in those areas where storms greatly reduced their numbers. In 1927, however, Mr. F. B. Day, who has taken particular interest in reëstablishing Martin colonies, reported a number of successful ones in Massachusetts.

Many attempts have been made by artificial means to establish Purple Martins in regions from which they have disappeared, but so far as I am aware no conspicuous success has been recorded. Eggs taken from martin boxes have been sent long distances, and placed in the nests of such insectivorous species as Barn Swallows, Tree Swallows,

[1] Destruction of Birds by the Elements in 1903-04. Fifty-first Annual Report of the Massachusetts State Board of Agriculture, 1904, pp. 457-503.

[2] Seventh Annual Report of the State Ornithologist, from the Sixty-second Annual Report of the Massachusetts State Board of Agriculture, 1915, pp. 23-25.

[3] Birds of South Carolina, 1910, p. 138.

Phœbes, Bluebirds and Kingbirds, and while in some cases young Martins have been hatched from these eggs, they have not come to maturity. As they require more food than the young of the smaller birds, and as they remain longer in the nest, the foster parents apparently either cannot secure food enough, or tire of feeding such exacting young ones.

Attempts have been made to move whole colonies of Martins in the night, by imprisoning the birds in their homes and setting them on poles in other localities. This method has been proved successful for short distances, but in only one case has it succeeded where they were removed by rail for a long distance, and that colony persisted only for the following year. Young birds nearly fledged have been removed for considerable distances and raised successfully by hand, but I have heard of no permanent colony established in that way. The ancient practice of erecting martin houses on tall poles is the only one that has been successful in New England. It has given us the comparatively few colonies of Martins now in existence here.

Haunts and Habits. What can add more in life, color and action to a country place than a handsome martin box with a great colony of Purple Martins? Their loud and cheerful voices, their rapid, aërial evolutions, and their swift massing for attack on an enemy of the flock, always attract attention. When domiciled in the yard of a farm home, they protect the chickens by attacking hawks and crows *en masse* the moment these marauders appear in the vicinity. Since their colonies have so sadly decreased in number in Massachusetts, many people eagerly inquire where the birds may be found, and go many miles to see them.

Purple Martins are fond of wide river valleys, where slow streams flow, flanked by broad meadows, but they have nested on highlands, and even on the high roofs of city blocks, or in recesses and holes about the roofs of buildings on busy city streets. They may be attracted almost anywhere in open unforested country by erecting suitable nesting boxes. In a publication of the Massachusetts Department of Agriculture, entitled "Bird Houses and Nesting Boxes," I have endeavored to describe houses that will attract them. If such houses are put up on tall poles and not too near trees or occupied dwellings, the Martins are likely to find them. But no martin house should be erected (or if erected the entrance should be kept closed) until the Martins arrive, usually about the 15th to the 20th of April in eastern Massachusetts. It is well to have the pole hinged, so that the box may be readily taken down. Often Martins will merely visit the box the first season, and will settle in it the second, if other birds are kept out. Mr. Arthur W. Brockway, of Hadlyme, Connecticut, wrote to me in 1920 that when the Martins arrived, he immediately set up the box for them, and that they were so glad to see it they could not wait until it was up. While it was going up they flew around it, singing and fluttering about it, and when it was half-way up they all alighted upon it and rode up with it. Others have told similar tales of localities where, as in this case, a colony had been established previously. Often in early spring one or two birds will come first, as if to inspect the tenements, and then disappear. Later more arrive.

The Purple Martin usually flies at moderate speed, but at need it can fly very fast. It easily catches fast-flying dragon-flies and butterflies that are such expert dodgers that comparatively few birds get them. It takes nearly all of its food on the wing. Nevertheless some individuals learn in cases of emergency to go to the ground, where they walk about and pick up or catch insects. In severe weather such birds might survive by thus obtaining dead or benumbed insects from the ground. Some have been seen to flutter over rose bushes and pick off rose beetles, but such habits may be individual and exceptional. A colony of Martins will scour the country far and near, meantime catching hosts of flying insects.

In early spring a few adult males usually arrive first, choose their boxes, and impatiently await the arrival of the females. Later arrivals include both sexes. Ordinarily, mating occurs soon after the females arrive. Immature birds usually come later and mate later than adults.

A flock of these birds, all gathering material for their nests, is a pretty sight. Nest building is shared by both sexes, and occupies several days. Most nests that I have examined have been protected in front of the entrance by a wall of mud. When the young are hatched both parents care for them and feed them, and at the end of from 24 to 28 days they are about ready to leave the nest. This feeding period is a time of great activity. I have never been so much impressed by the number of insects required by young birds as, when perched at the top of two braced ladders, I watched the parent birds feeding their young in a large martin box. Every few seconds a bird struck that box, alighting at an entrance with its gullet or its bill full of insects. Among the insects brought were some large dragon-flies; some were brought by the wings, and the young bird leaning forward snatched the insect and swallowed it, often with difficulty, leaving the wings in the beak of the parent. Some were held by the body in the beak of the adult bird and were swallowed wings and all by the young bird, though the ends of the wings stuck out of its mouth for some time afterward. In some cases small snails and eggshells are fed to the young along with their insect food.

Excessive heat and swarming parasites in summer often cause the death of young Martins in the nest, or they are killed by falling to the ground, in their attempts to escape from suffocation or the tormenting parasites in the nest. When a young bird falls to the ground it is soon deserted by its parents, who give up the attempt to preserve its life, and if not killed by the fall it is soon picked up by some cat or other prowler. The young sometimes remain in the nest for about six weeks. The parents have a habit of collecting many green leaves and placing them in the nest, a practice which may tend by evaporation to reduce the heat. Where large colonies are breeding they sometimes injure pear trees by stripping certain branches of their leaves.

Usually when the young leave the nest they fly quite readily, but many of them return to the nest night after night for a week or ten days, especially if the weather be windy and stormy. In the meantime they learn to alight on trees and on the wires of telephone or telegraph lines. In the latter part of August or early in September the

Martins begin their southward migration. Usually old males are the first to go. They have been gradually assembling in large flocks which roost together at night, usually in trees with dense foliage. Then a day comes when at daybreak all is excitement and commotion. Soon the flock circles and rises to a great height, and off they go, commonly heading southwest. The young birds follow a little later in the season.

In the South the number of Martins exceeds greatly that of the birds in the North. Mr. William Dutcher relates the following: "Martins are accustomed to gather in large flocks during the latter part of summer for the purpose of roosting in some favored grove. As they journey southward, apparently, these flocks increase in size, and the writer has on several occasions watched the birds coming to their roosts in the evening in astonishing numbers, estimated at 100,000. They seem to prefer a grove near a human habitation, for their nightly rendezvous. They create no little comment in the neighborhood because of their numbers, and by their noisy chatter and fluttering, particularly during the early part of the night. There is usually little prejudice against them, but not infrequently the people in the neighborhood make excuse that the birds are a nuisance, and shoot into the flocks when they come to roost.

"At Wrightsville Beach, North Carolina, a great number of these migrating birds gathered, in the summer of 1905, and chose as their nightly roosting place the grove of a summer hotel. The proprietor, wishing to rid himself of them, invited a number of his neighbors, who, lying in wait for the birds, fired into the trees and continued to shoot until the ground was literally covered with the dead and dying birds, and for days afterward wounded Martins could be found fluttering about the neighboring lawns and roadside. Estimates of the number of birds killed vary from 8,000 to 15,000.

"On hearing of this tragic violation of the law the North Carolina Audubon Society sent out a warden to prosecute the offending parties, twelve of whom were convicted and fined in the local court. The warden, to prevent any further slaughter, arranged a number of tar-barrels to the windward of the grove and fired them in the evening, thus creating a dense smoke, which, drifting over the grove, drove the birds away, and they were not seen again. A citizen of the place said that it had been very noticeable that since the appearance of Martins there had been less mosquitos than for many years previous, and he thought that the community would never again allow these valuable birds to be slaughtered in that locality." [1]

Virtually all the food of the Purple Martin consists of insects, of which they eat a great variety, mostly in the mature or flight stage. Professor F. E. L. Beal reported on an examination, made for the Biological Survey, of the stomach contents of 205 Purple Martins. His report shows that their food consists entirely of animal matter, chiefly insects, and a few spiders. Ants, parasitic flies, a few honey-bees (all drones), a small proportion of diptera, a larger proportion of hemiptera, including such destructive bugs as the squash-bug (*Anasa tristis*), and other large bugs that injure fruit and plants were eaten. There were many beetles, including the cotton boll weevil, the clover-weevil,

[1] Dutcher, William; National Association of Audubon Societies, Educational Leaflet No. 13, 1920.

the strawberry-weevil and other pests. Many butterflies and moths (the parents of destructive caterpillars) and very few orthoptera. Many dragon-flies were found, and they were evidently a favorite food. Butterflies and grasshoppers are fed to the young, but the parents appear to avoid feeding to them worker bees or any other stinging insect.[1]

Economic Status. The fact that the Purple Martin eats a considerable number of useful parasitic insects is set over against its beneficial habits. Adult dragon-flies are considered to be useful, as they destroy harmful smaller insects, including mosquitoes, but the young of dragon-flies are destructive to small fishes, and this habit may neutralize the beneficial habits of these insects. As Martins are said to feed heavily at times on mosquitoes, their destruction of dragon-flies may be immaterial. There is evidence to show that the presence of a colony of Martins is very beneficial to the trees and plants surrounding their home. Mr. J. Warren Jacobs, of Waynesburg, Pennsylvania, who has a very large colony of Martins, found that they were feeding large numbers of fruit-tree bark-beetles to their young. He asserts that his trees and vines are never sprayed, that their foliage is in excellent condition, and that they produce excellent crops of fine, perfect fruit, some of it exceedingly large. In proof of his assertion he prints reproductions of photographs showing his trees in fine foliage, and excellent fruit. He does not, however, credit the Martins alone with the protection of his fruit, but assigns part of the credit to other insectivorous birds, which he takes pains to attract to his estate. In some instances a great decrease of mosquitoes is said to have followed the establishment of Martin colonies, but I have had no opportunity to investigate these reports.

Petrochelídon lúnifrons lunifrons (Say). Cliff Swallow.

Other names: eaves swallow; mud swallow.

Plate 76.

Description. — Form similar to that of Purple Martin, but bill not hooked at tip and tail relatively shorter and nearly square or very slightly forked, barely reaching to tips of closed wings. *Adults* (*sexes practically alike*): Forehead very light, from dull white to pale brown, sharply defined as a pale crescent against glossy blue-black of crown; hind neck and sides of neck light brown to brownish-gray; back and scapulars glossy bluish-black, but back streaked with whitish, rump pale reddish-brown; upper tail-coverts grayish-brown or brownish-gray with lighter margins; wings and tail dusky grayish-brown with some paler feather-edges; lores blackish; sides of head, chin and throat chiefly rich chestnut, which sometimes extends as a narrow margin around the blue-black on back of head; patch of glossy black on lower throat, sometimes brokenly extended down middle of upper breast, which with sides and flanks is pale grayish-brown; rest of lower plumage white or whitish, except longer under tail-coverts which are dark grayish with whitish margins and tips; wing linings and axillars pale grayish-brown; bill black; iris dark brown; legs dark reddish-brown; feet dark brown. *Young in first winter plumage:* Apparently as adults, and indistinguishable from them. *Young in juvenal plumage:* Unlike adults; above, including wings and tail, chiefly dark grayish-brown or sooty, with some greenish reflections on crown; rump (and often forehead) cinnamon; tertials and some wing-coverts margined pale vinaceous-cinnamon; sides of head and throat mixed grayish-brown or dusky, sometimes mixed with dull chestnut; rest of under plum-

[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 619, 1918, pp. 3–6.

age as adults, but sides, flanks and under tail-coverts tinged pinkish-buff; bill dull black; feet dusky or sepia.

Measurements. — Length 5.00 to 6.00 in.; spread 12.00 to 12.30; folded wing 4.05 to 4.85; tail 2.00 to 2.40; bill .29 to .38; tarsus .45 to .52. Sexes about equal in size.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage apparently by complete postjuvenal molt, beginning about head in late August (when some show complete pale crescent on forehead) and completed sometime after they leave the north; first breeding plumage probably by wear; adults acquire winter plumage by complete postnuptial molt, and breeding plumage by wear.

Field Marks. — Size near that of Barn Swallow, but with much shorter tail, nearly square. *Adult:* Distinguished from our other swallows by pale cream-white forehead and pale reddish-brown rump, both contrasted against dark contiguous plumage. *Young:* More brownish than adults, but rump light, if not pale, and two inconspicuous, narrow, light wing-bars.

Voice. — A series of chattering notes and a squeaky so-called song, not very musical, but cheerful and not unpleasing.

Breeding. — Wherever suitable accommodations for nesting may be found. *Nest:* Attached to side of cliff, hard embankment, tree trunk or building; built of mud or clay, lined with grass, leaves, feathers, wool, etc. *Eggs:* 4 or 5; .70 to .80 by .60 to .65 in.; long ovate; white, creamy or pinkish-white, rather thickly marked with reddish-brown and darker browns, resembling eggs of Barn Swallow; figured by E. A. Capen in "Oölogy of New England," Plate VI, Figs. 11–13. *Dates:* May 3, Virginia; May 26 to June 6, Rhode Island; May 25 to July 20, Massachusetts; May 29 to June 24, Maine. *Incubation:* Period 12 to 14 days (F. L. Burns); by both sexes. One brood yearly.

Range. — North America, Central America, and south to southern South America. Breeds from the southern edge of the Arctic Zone to the Lower Austral Zone from northern Manitoba, northern Ontario, southern Quebec and Anticosti and Cape Breton islands south to northern Texas, northern Mississippi and Virginia, also western United States south of Montana, south to Lower California and northern New Mexico; migrates south through the southeastern United States, probably Mexico and Central America; winters in parts of South America south to Argentina; accidental in Cuba.

Distribution in New England. — Common migrant; local summer resident, more common in Maine than in other New England states, formerly much more common generally.

Season in Massachusetts. — April 20 to September 14 (September 30).

History. The early history of the Cliff Swallow is involved in obscurity. We hear of it first in an account published in "Philosophical Transactions" in 1772, where John Reinhold Forster, in an account of birds sent from "Hudson's Bay," refers to it as *Hirundo No. 35*, but gives it no name.[1] Audubon says that he saw the bird at Henderson, Kentucky, on the Ohio River in 1815, and that he saw it again at Newport, Kentucky, in 1819; but it was first described and named as a new species by Thomas Say, in the account of Long's "Expedition to the Rocky Mountains," compiled by Edwin James in 1823. This type specimen was taken in 1820. It was also discovered in 1820 by the expedition of Sir John Franklin at latitude 65°, while on the journey from Cumberland House to Fort Enterprise. The belief was quite general at once time that the Cliff Swallows, finding both shelter and strong points of attachment for their nests under the eaves of the rough buildings of the early settlers, gradually moved eastward from the Rocky Mountains and so settled in the northeastern states and the southeastern provinces. Probably, however, they were already established in this area on some of the

[1] Philosophical Transactions, Vol. LXII, 1772, Article XXIX, p. 408.

rather infrequent cliffs of the eastern country, which they forsook later to take up their residence under the protection afforded them about the dwellings of mankind, wherever clay or mud could be found sufficiently plastic and adhesive to answer their purposes. In 1817 they were seen at Whitehall, New York, at the southern end of Lake Champlain, and about the same time at Randolph, Vermont. In 1818, according to Nuttall, they were nesting at Crawfords in the White Mountains of New Hampshire, and it is quite probable that some of the older inhabitants of Lynn, Massachusetts, were right in the belief that Cliff Swallows nested on the Nahant rocks. In 1861, Professor A. E. Verrill discovered a large colony breeding in the primitive manner on the cliffs of Anticosti Island, in the Gulf of St. Lawrence. Possibly they had bred there from time immemorial.

As the land of New England was cleared for fields and pastures, and as barns with wide eaves were erected, we may suppose that the Cliff Swallows, finding abundant food and good shelter on the farms, deserted their inhospitable rocks for the new type of refuge afforded by buildings and, multiplying exceedingly, spread from place to place over the land. It is not improbable also that there was an eastward movement later from the bluffs and cliffs west of the Mississippi. Thus the "Cliff" Swallows under man's protection became "Eaves" Swallows and waxed fat and numerous until the decade beginning in 1870, when the House Sparrow began to increase and spread over New England. Then the nests built by the industrious Cliff Swallows were appropriated, after a struggle, by the swarming and ubiquitous Sparrows, whose clumsy and bustling occupancy soon resulted in the destruction of their stolen domiciles. As the Sparrows increased in southern New England, they spread northward and eastward until the greater part of the Cliff Swallows had been driven into Maine. Another factor in the diminution of the Cliff Swallows was the substitution of modern, painted barns for the rough, unpainted buildings which formerly predominated in New England. Swallows' nests will not adhere long to the side of a freshly painted building, and it is only when the paint has become much weathered and worn that these birds can find safe attachment for their nests. In recent years their colonies have been few and far between in southern New England, but doubtless their numbers have increased somewhat since the recent decrease of the Sparrows.

Haunts and Habits. During my childhood, double rows of Cliff Swallows' nests under the wide eaves of some great unpainted barn were commonly seen in Massachusetts. I remember well such a colony within the present city limits of Boston, and the swarm of birds that played about this barn during the nesting time. They did not arrive in spring until after some of the Purple Martins had come, but when the Cliff Swallows came their numbers about their chosen resorts were even greater than those of the Martins.

The Cliff Swallow, unlike the Barn Swallow, makes "bricks without straw." Usually it does not use dried grass or hay to hold its plastic building material together. Therefore it must have clay or clayey mud for building material. If there is too much sand

in the mud the nests, when dry, will fall. So it is probable that Cliff Swallows never were abundant on sandy lands like those of Cape Cod. In such localities they have tried time after time to build their nests and in some cases have persevered, building them over and over, only to invite repeated disaster, until at last they have deserted such sections forever. As they cannot build without mud, an exceedingly dry time may delay their home-making far beyond the usual date. At such times some of their human friends assist them by making artificial puddles or by mixing up wet clay, and the alert birds are quick to take advantage of such benevolent assistance. They are so adept at gathering their material that they can hover over the bottom of a miry ditch that offers no secure footing, and dexterously snatch up mouthful after mouthful of viscid mud, but they prefer to stand on the edge of a puddle and work at their leisure.

The first pellets are plastered on the barn where the base of each nest is to be, and the birds cling to the rough boards, bracing themselves with their tails like woodpeckers, and hold the mud in position until it has dried sufficiently to adhere and retain its form; from this foundation a base is built in the shape of a very shallow half-cup. On this the back wall is erected and then the sides are built up. The builders usually work at the nest only a few hours each day. They do not seem to be in great haste, and four or five days may be occupied in fashioning each structure. If heavy rains or cold days come, the work of construction may be still further delayed, and then the nest-building period may extend to ten, fifteen or even twenty days. Driving storms sometimes destroy many nests, but the optimistic birds persevere. Often the female is obliged to deposit eggs before the nest is finished, but still the work goes on.

Dr. Coues writes entertainingly of this communal effort, as follows: "It is pleasant to watch the establishment and progress of a colony of these birds. Suddenly they appear — quite animated and enthusiastic, but undecided as yet; an impromptu debating society on the fly, with a good deal of sawing the air to accomplish, before final resolutions are passed. The plot thickens; some Swallows are seen clinging to the slightest inequalities beneath the eaves, others are couriers to and from the nearest mud-puddle; others again alight like feathers by the water's side, and all are in a twitter of excitement. Watching closely these curious sons and daughters of Israel at their ingenious trade of making bricks, we may chance to see a circle of them gathered around the margin of the pool, insecurely balanced on their tiny feet, tilting their tails and ducking their heads to pick up little 'gobs' of mud. These are rolled round in their mouths till tempered, and made like a quid into globular form, with a curious working of their jaws; then off go the birds, and stick the pellet against the wall, as carefully as ever a sailor, about to spin a yarn, deposited his chew on the mantel-piece. The birds work indefatigably; they are busy as bees, and a steady stream flows back and forth for several hours a day, with intervals for rest and refreshment, when the Swallows swarm about promiscuously a-flycatching. In an incredibly short time, the basement of the nest is laid, and the whole form becomes clearly outlined; the mud dries quickly, and there is a standing place. This is soon occupied by one of the pair, probably the female, who now

stays at home to welcome her mate with redoubled cries of joy and ecstatic quivering of the wings, as he brings fresh pellets, which the pair in closest consultation dispose to their entire satisfaction. In three or four days, perhaps, the deed is done; the house is built, and nothing remains but to furnish it. The poultry-yard is visited, and laid under a contribution of feathers; hay, leaves, rags, paper, string — Swallows are not very particular — may be added; and then the female does the rest of the 'furnishing' by her own particular self. Not impossibly, just at this period, a man comes with a pole, and demolishes the whole affair; or the *enfant terrible* of the premises appears, and removes the eggs to enrich his sanded tray of like treasures; or a tom-cat reaches for his supper. But more probably matters are so propitious that in due season the nest decants a full brood of Swallows — and I wish that nothing more harmful ever came out of the bottle."[1] (The word bottle is used here in reference to the primitive shape of the nests.)

The Doctor goes on to say that he has seen in the West many nests of Cliff Swallows built among the outer sticks of Great Blue Herons' nests, and has even seen them attached about the cliff-built nests of the Prairie Falcon. In each case the larger birds attended to their own duties, apparently not molesting their little tenants. Some nests are built of such lasting material and are so firmly attached and so well sheltered that they are used year after year, probably by the same birds. The usual shape of a Cliff Swallow's nest when built on the exposed face of a cliff resembles that of a retort or a gourd with the stem projecting outward and slightly down-curved. But many nests built under the shelter of wide eaves or under the roof of a building lack the neck, and some are merely cup-shaped, much like those of the Barn Swallow. In such sheltered situations the protection afforded by the enclosed, vestibule type of construction is unnecessary. Occasionally a pair of Cliff Swallows will build a nest on and over an abandoned nest of the Barn Swallow, Robin or Phœbe.

Occasionally three Swallows may be seen engaged in building one nest. Mr. E. O. Grant watched a nest at Long Lake, Allegash, Maine, which was built by three birds, and he says that they all took turns at incubating the eggs. He believed them to be two males and a female.

When the young birds are fledged some of them seem loath to leave the nests, and when entreaty fails to move them the adults begin to break down the nest, thus forcing the reluctant youngsters to try their wings. In one case three of the brood were induced to leave the nest, but one failed to depart; finally the parents flew away and left it, but about two hours later they came back with six more birds; all darted and pecked at the nest until they tore it to pieces, and the young bird fell to the ground. It was then seen that one of its feet was attached to the clay by a hair, in a snarl of which it had become entangled. A kind lady released the fledgling, the parents took charge of it and the other swallows flew away.

Miss Clara E. Reed tells of a nest, containing young, that fell; when it struck the ground it crumbled. The young birds were placed in a strawberry basket which was

[1] Coues, Elliott: Birds of the Colorado Valley, Part First, 1878, pp. 433, 434.

hung up in the old nest location. A day or two later the parent birds were seen to fill the corners of the basket with mud. Then apparently they lined the basket, and before the young birds flew, the parents had built almost an entire nest, to which they returned the following year. In many cases after the young have flown, the mother bird calls them back to the nest at night to sleep. If the family has grown too large to enter it, they sit about on or near it, and in case of a rainstorm they may seek shelter there during the day. The parents feed them whenever possible. In case of a long-continued cold storm many of them are likely to starve to death.

As Cliff Swallows cannot attach their nests firmly to well painted buildings, those who wish to accommodate them on such buildings should furnish supports for their nests. They require wide eaves to shelter them, and a two by four inch scantling nailed flat upon the building, so that its upper and outer edge will be about five inches below that part of the eaves directly above it, will furnish a two inch support for their nests. This and a supply of clay or adhesive mud, a little hay and some feathers are all that they require for building.

At least three different parasites infest the nests of these swallows, one of which closely resembles the notorious bed-bug, but really is a different species which never troubles mankind.

Professor F. E. L. Beal made a careful study of the food of this species, based on the contents of 375 stomachs, taken from March to September, and fairly representing its food materials while in the United States. With the exception of a few wild berries and a few spiders the food materials consisted entirely of insects. Among them were such nationally known pests as the boll weevil, rice weevil, alfalfa weevil and chinch-bug.[1]

Economic Status. Professor Beal says that the food of the Cliff Swallow "contains few elements that can be criticised from an economic point of view." Like all swallows it takes some useful parasitic and predacious insects, but also a great preponderance of harmful species. It is a bird to foster and protect.

Hirúndo erythrogástra Boddaert. Barn Swallow.

Plate 76.

Description. — Formed somewhat like Cliff Swallow, but differing from all other New England swallows in having a deeply forked tail with long outer feathers. *Adult male:* Forehead chestnut, elsewhere above glossy dark steel-blue; wings dusky or blackish and steel-blue with some slight greenish gloss; tail chiefly dusky, all but central pair of feathers with white or whitish spot near end of inner web; below chestnut or rusty-cinnamon on chin and throat, lightening from breast to tail; an imperfect band of steel-blue across upper breast; iris dark brown; bill, legs and feet black. *Adult female:* Similar to adult male, some almost indistinguishable, but usually duller above, paler below, and outer tail-feathers shorter. *Young in first winter plumage:* As adults. *Young in juvenal plumage:* Above, dull brownish, greenish or bluish, becoming browner on top of head; lores and ear regions blackish; chestnut band on forehead smaller and less distinct than in adults; wings and tail dull greenish-black or greenish-dusky; tail

[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 619, 1918, pp. 7–11.

much shorter than in adult, but similarly marked; throat much as in adult, but duller, breast-band slaty-black; rest of lower plumage paler than in adults; bill pinkish below.

Measurements. — Length 5.75 to 7.75 in.; spread 12.50 to 13.50; folded wing 4.50 to 5.00; tail 3.00 to 4.50; bill .32 to .55; tarsus .35 to .48. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage virtually as adult, probably acquired by complete postjuvenal molt after bird leaves on its southern migration; first breeding plumage probably by wear, and adult winter plumage by complete postnuptial molt after bird has departed; adults have a single molt (complete postnuptial) in autumn and winter, and breeding plumage is the result of wear.

Field Marks. — Size about that of Cliff Swallow but tail longer. *Adults:* Our only swallow with a long, deeply forked tail; *forehead and throat chestnut;* no red-brown on rump. *Young:* Like adults, but duller or browner above, paler below and tail shorter.

Voice. — A gentle twitter, or, when excited, a more emphatic *kittic.* Song, a succession of twittered notes; "a low chattering trill" often followed by a clear liquid note (E. P. Bicknell).

Breeding. — Usually in open country about farms or villages, and not far from water. *Nest:* In cavern or crevice in cliff, rocky bluff or shaft of a mine, in some crevice in a steep bank, or in some giant hollow stub of an old tree, under a bridge or wharf, or in or about a building, most commonly in a barn; composed of mud and hay or straw, lined with finer, softer material, and usually with feathers, shaped somewhat like the half of a shallow cup, and plastered on a sheer wall or on some supporting projection. *Eggs:* 3 to 6; .68 to .94 by .50 to .62 in.; usually ovate or elliptical ovate, but very variable in shape; white or whitish, spotted variously with reddish-brown and darker brown, and some with purplish also; often indistinguishable from those of Cliff Swallow, but usually more elongated; figured by E. A. Capen in "Oölogy of New England," Plate VI, Figs. 8, 9. *Dates:* May 12 to June 28, Virginia; May 18 to July 12, Massachusetts; May 28 to July 1, Maine. *Incubation:* Period 11 days (F. L. Burns), 13 days (Miss J. O. Crowell); probably chiefly by female. Two broods yearly, occasionally three.

Range. — North America, Central America and south to southern South America. Breeds from northwestern Alaska, northern Mackenzie, Manitoba, northern Ontario, southern Ungava (central Quebec), southern Labrador and Newfoundland south to northern Lower California, southern Texas, southern Arkansas, northern Alabama and southern North Carolina and south in Mexico to Puebla and Michoacan; migrates through Bahamas and West Indies; winters from southern Florida, southern California and southern Mexico to Brazil, Chile and Argentina; accidental in the Galapagos, Bermuda, southern Keewatin and Greenland.

Distribution in New England. — Common migrant; common summer resident in all settled country, except on higher elevations of northern Maine and northern New Hampshire.

Season in Massachusetts. — (April 2 and 5) April 10 to September 30 (October 13 and 17, November 1, 2 and 4).

Haunts and Habits. No bird in North America is better known or more truly the friend and companion of man than the swift and graceful Barn Swallow. It nests within his buildings and with a flight that seems the very "poetry of motion" it follows the cattle afield or swoops about the house dog as he rushes through the tall grass, and gathers up the flying insects disturbed by his clumsy progress. When the mowing machine takes the field, there is a continual rush of flashing wings over the rattling cutter-bar just where the grass is trembling to its fall. The Barn Swallow delights to follow everybody and everything that stirs up flying insects — even the rush and roar of that modern juggernaut, the motor car, has no terrors for it. Dr. Eleanor Mellen writes from Nantucket: "When we drive out to the Hummock Pond section, toward 6 P.M., the Barn Swallows

join us at the last farmhouse, dart about the car, over the hood, almost in at the windows, and go all the way to the shore with us (about a mile). When we stop, they fly about near us, light on the ground and wait till we start, then escort us back, indulging in the same pastime." When two stops were made, the birds settled, and they waited in each case until the car started again.

The Barn Swallow is a truly admirable bird — well-beloved for its excellent disposition and its altruistic behavior. It is brave, but not quarrelsome. Many nest side by side in the same building with little friction, although occasionally two pairs clash over the same nesting site, and the battle lasts until one or the other gives up the fight. It is said that as many as two hundred sometimes occupy the same barn. In my experience, however, forty nests in one building is the maximum. All join in attacking the common enemy. The appearance of a strange cat, a weasel or a Sharp-shinned Hawk, when the Swallows have young, is the signal for a concerted assault. I have even seen a lone pair of breeding birds drive both cat and weasel from the neighborhood of their helpless young. They also assist one another at need in other ways. Miss Annie F. Towne, of Topsfield, tells how a pair built a nest on the house of a neighbor, who tore the fabric down. Soon many Swallows appeared and helped to build it over again in the same place, completing it very quickly. This second nest was allowed to remain. Thoreau tells of a Concord man who said that he shot at a Swallow with a rifle and evidently touched the bird somewhere, for it attempted to fly across the river, dropping lower and lower all the time, when another Swallow flew beneath it and pushed it upward, and continued to do this until both birds passed "out of sight." I have a report of a similar occurrence where an adult thus supported a young bird that had left its nest prematurely.

When the first settlers came to this country, the Barn Swallows nested in caverns and crevices and under projecting shelves along our "rockbound coast" as well as on the high rocky shores of certain lakes and rivers, in great hollow trees, or in caves and recesses of mountain cliffs. They must have left the primal nesting places early to consort with mankind, for now they are not known to use such nesting places, except in the northern wilderness and on the Pacific coast. Old residents of Lynn, Massachusetts, who were still living in the latter part of the nineteenth century, could remember when Barn Swallows in numbers nested in the "Swallow Caves" at Nahant, situated on the south side of the rocky peninsula known as Little Nahant.

As the country was settled they forsook their grottos in the rocks for barns, sheds, bridges, boat-houses, wharves and abandoned or unoccupied dwellings. There is no more skilful mason among the feathered tribes than this same Barn Swallow. Years ago I encamped in an abandoned house on the inner shore of Sandy Neck, Barnstable, Massachusetts, where Barn Swallows had built their nests. The walls of the room were plastered and smoothly finished, but the little feathered artisans had affixed their nests to the smooth, upright, plane surface of human masonry and had attached it so firmly and well that they could rear their young in perfect safety, for no climbing animal could scale that sheer wall. Since then lightning has riven the old house and vandals have

destroyed it, leaving to me only a pleasant memory of the little colony of twittering birds. This is the only case known to me where Barn Swallows have built nests on such smooth walls without support, and there may have been a concealed supporting nail or two projecting from the wall unobservable by me. Swallows often avail themselves of such a foundation. A pair of projecting nails or a small block of wood nailed to a sheer wall may be utilized by them in situations where, otherwise, they would not attempt to build.

During the latter part of April the pioneers of the Barn Swallow host usually appear in Massachusetts. Sometimes they come too early and are met by cold and storm and so, unable to obtain food, they seek shelter in some building or huddle together behind a closed blind or window sill on the south side of a house until the sky clears and the temperature moderates. By snuggling together in their nests, some of these birds have been able to survive two or three cold days, when morning outdoor temperatures were as low as 15 to 17 degrees above zero mark, but such temperatures may be fatal, even when the birds are well protected.

If, when the Swallows arrive, they find the building closed in which they are accustomed to breed, they sometimes approach the house and fly about it, or about any inmate who appears, twittering and calling until someone takes pity on them and opens a door or window, when they immediately enter, showing their gratification by happy excited twittering. Many farmers cut a small hole in a barn gable to accommodate the birds.

The courtship of the Barn Swallow takes place largely on the wing, she flying, he pursuing, but its culmination often occurs on a building. Nest-building is an absorbing occupation. In a dry time mud may be scarce near-by, and some farmers go to the trouble of mixing some for the swallows. Where this is done the alert birds find it immediately, and some may even hover happily about while the mixing is going on. Having fashioned their mud-built habitations, they readily find dried grass or hay for lining, but feathers are always in demand. Some people put out feathers for them, and take delight in watching their aërial evolutions in pursuit of the elusive things. In a high wind the feathers are hard to catch and are frequently blown out of the Swallow's beak after she has seized them. Or if a bird holds firmly to a large feather, she may be blown to one side or even turned about when she endeavors to breast the gale. In their eagerness to receive their feathers they will almost come to the hand for one. Mrs. Herbert J. Lombard tells how a little child in a field near the house picked up a fluffy white feather and held it up among the buttercups and daisies, which were as tall as he. A Barn Swallow darting about his head finally snatched the feather from his hand to line her nest. I believe that all swallows take white feathers in preference to dark ones of any color.

As the mud nests are strengthened with straw, and usually plastered on rough boards or rafters, or on a small support, and as they are under cover, they rarely fall, as those of Cliff Swallows often do and the young are fairly safe unless a Screech Owl enters the building at night. Therefore as the birds usually rear two broods each year, they are perhaps the most numerous of our swallows. If all goes well the young birds leave the

nest in about sixteen days. They first exercise their wings within the building and then try them out of doors. When the young are able to fly well, they do not desert the old home entirely, but often spend several nights in or near the nest. Now and then they return later to the same neighborhood, and some have been known to join the parents in feeding young of the second brood. Most of the individuals of the first brood probably leave for the sea-shore in August, where they flock with other swallows in preparation for their southward journey. The male usually cares for the first brood after they are well able to fly and until they learn to catch their own food; meanwhile the female prepares for the second brood. In one case she (or the pair) built a very flat nest on a board, braced flat between two rafters, and then built a little mud wall nearly the whole length of the board (about three feet), as if to keep the young from falling off.

There is considerable individuality among Barn Swallows, some being very tame and fearless. A pair built their nest close by a blacksmith's forge and reared their young, regardless of wheezing bellows, clanging hammers and showering sparks. Another pair in Falmouth, Massachusetts, built their nest in a room on a large farm, where agricultural products were daily prepared for market. They threaded their way in and out among the busy workers, industrious and fearless in their care for their growing young. A pair in Westborough, Massachusetts, took for their nesting-place a narrow shelf, in a barn, five feet above the floor, almost over a cow, where the milker could look directly into the nest. They stayed there and raised their young.

Barn Swallows are children of the aërial spaces. They spend a great part of each long summer day on the wing. They eat and drink on the wing, as they drink and also bathe by dipping down to the surface of the water. Thus they are exposed to some danger from large frogs and swift fishes, which sometimes jump at them. The frog, unlike the toad, takes its prey by a sudden leap with widely distended jaws, and swallows it at once. Mr. Thornton W. Burgess sent me a report on this habit from Mrs. Chester Bancroft, of Tyngsborough, Massachusetts. There is a brook flowing through the Bancroft yard, in which lived an enormous bullfrog, which Mrs. Bancroft's daughter had been watching with interest during the summer of 1927. One day she saw the tips of a bird's wings protruding from the corners of his mouth. The frog was finally caught and relieved of what he had swallowed. It was a full-grown Barn Swallow.

Barn Swallows seem to be better equipped to fight for life during long, cold storms in the breeding season than Purple Martins or Chimney Swifts. In flooded areas they fly close to the surface of the rising waters, and pick off insects that have been driven to the tops of reeds and grasses, or they go to the ground and pick up dead or benumbed insects, and they even eat berries or seeds. Thus, in the disastrous storm of June, 1903, many of them came through alive, though most of the young in the nests perished, while at the same time the Purple Martins were almost exterminated and the Chimney Swifts were sadly reduced.

The Barn Swallows are very industrious birds, working many hours daily, and missing no chances. I have seen them flying along the margin of a river, where mosquitoes were

abundant, until the moon rose and the bats came out, and have seen them on the same river when it was so dark that they could be recognized only by their notes. Farmers often, with some reason, predict the coming weather by the flight of these and other swallows. When the air is warm and the sky clear, many small insects rise very high with the upward currents and the swallows follow them. In cool, cloudy weather, with no upward movement of heated air from the ground, insects fly low, and the swallows then sweep close to the water or the grass tops.

Before the middle of August, the different species of swallows in the interior, preparing for migration, gather to roost in the river marshes. They begin to collect there before dark, fluttering lightly down and alighting so gently on the tops of wild rice, sedges, reeds and bulrushes that their footing rarely gives way. Sometimes hundreds so gather to pass the night. From these roosts they start early some fine morning, hawking about low down at first, picking up their breakfasts and then, rising high, pursue their flight to the coast, where they join hundreds or thousands more, and all move gradually southward, feeding as they go.

The normal food of the Barn Swallow is practically all animal, and nearly all insect matter, with the exception of a few snails and some spiders. Its food is similar to that of the Cliff Swallow. It takes similar injurious beetles, especially weevils, many ants and bugs, enormous numbers of flies and mosquitoes, and many bees and wasps, but practically no honey bees. It takes small noctuid moths, such as the parents of the smaller cut-worms and those of *arctians* and *crambids*, also codling-moths, the parents of the apple-worm, and some of the insects destructive to cranberries. Like Martins and Cliff Swallows it seems fond of egg-shells, which it goes to the ground to get, possibly for the lime contained in them, as it has been attracted by bits of wall plaster scattered on the ground, which also contain lime. Swallows catch enormous numbers of insects. When one was shot on the wing, the gullet was found so packed with insects that when the mass was removed from its confining membranes it swelled to twice its original size. Most of the food for the young is carried thus and regurgitated as a pellet or bolus into the mouths of the eager nestlings.

Economic Status. The Barn Swallow is generally and rightly regarded as a useful bird. It injures none of man's products. It destroys some useful parasitic and predacious insects, but takes far greater numbers of insect pests, especially those found about farm buildings, such as house flies, horse flies and others that bother cattle, also ants and mosquitoes, as well as many crop pests.

Iridoprócne bícolor (Vieillot). **Tree Swallow.**

Other names: WHITE-BELLIED SWALLOW; LITTLE MARTIN; WHITE-BREASTED SWALLOW.

Plate 77.

Description. — Form somewhat similar to that of Cliff Swallow, with long wings; tail only slightly forked and not reaching to end of closed wings. *Adult male in breeding plumage:* Above and sides of head

and neck glossy greenish, steel-blue or bluish-green; greater wing-coverts, flight-feathers and tail dusky or sooty-blackish, with faint greenish gloss; lower jaw and all lower plumage white, except axillars and wing linings, which are gray or brownish-gray, paling toward edge of wing, where there are a few dusky-brown feather-tips; bill black; iris brown or dark brown; legs and feet variable, brownish, grayish-brown or horn-color. *Adult male in winter plumage:* Similar to same in breeding plumage, but tertials have grayish or whitish edgings and tips. *Adult female in breeding plumage:* Similar to male or as male, but usually duller above, often chiefly dusky-grayish-brown, with only tips of feathers glossy blue or greenish; upper breast frequently shaded brownish-gray. *Adult female in winter plumage:* Similar to adult male in same plumage. *Immature in first breeding plumage:* Similar to adults. *Young in first winter plumage:* Similar to adults in winter, but usually more green than blue above. *Young in juvenal plumage:* Above sooty-brown, the tertials slaty with faint grayish edgings and tips; below, white with faint interrupted sooty collar across lower throat; wings shorter than in adults, not reaching tip of tail.

Measurements. — Length 5.00 to 6.25 in.; spread 12.00 to 13.25; folded wing 4.50 to 5.00; tail 2.30 to 2.50; bill .30 to .35; tarsus .40 to .52. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by complete postjuvenal molt (mid-August to October); first breeding plumage by wear; adult winter plumage by complete postnuptial molt (August to October); adults have but one molt (postnuptial, late July to September) and acquire breeding plumage by wear.

Field Marks. — Size of Barn Swallow, but tail shorter, very slightly forked. *Adult male:* A bird of two colors, as its name "*bicolor*" implies, being mostly *steely-greenish-blue above, white below. Adult female:* Similar, or greenish above, with *faint dark band,* usually interrupted, across upper breast at base of throat. The Bank Swallow has a complete, wide brown band across breast, and the Rough-winged Swallow has both throat and breast tinted brownish. *Young:* Similar to female, but more brown above.

Voice. — "A shrill, lively, warbling twitter" (Nuttall); a low call to its mate (O. W. Knight).

Breeding. — Usually on farmlands or in open woodlands about water. *Nest:* In some tree cavity, in hollow fence rail, a crevice in bridge or building, or in some nesting box or bird-house; built of grass, straw etc., and warmly lined with feathers, white feathers usually predominating. *Eggs:* 4 to 10; usually 3 to 6; where larger numbers are found, they may be the product of two females; .69 to .83 by .45 to .57 in.; ovate; white, with rosy tinge when fresh; figured by E. A. Capen in "Oölogy of New England," Plate VI, Fig. 10. *Dates:* April 19 to June 15, Massachusetts; May 30 to July 12, Maine. *Incubation:* Period about 14 days; by both sexes. One brood yearly; "two broods are often reared in a season" (W. B. Barrows).

Range. — North America and Central America. Breeds chiefly in Canadian, Transition and Upper Austral zones from northwestern Alaska, central Yukon, southern and central-western Mackenzie, northeastern Manitoba, northern Ontario, northern Ungava (Quebec), Labrador and Newfoundland to southern California, Utah, central-western Texas, Kansas, northern Arkansas, Kentucky and Virginia; winters from central California, southern Texas, southern Alabama and North Carolina, and (casually) New Jersey, Long Island (New York), Connecticut and Massachusetts south over most of Mexico to Guatemala and Cuba; casual in Bermuda Islands; accidental in England.

Distribution in New England. — Common to abundant migrant (most numerous coastwise); common summer resident, though more or less local; casual in winter in southeastern Massachusetts, Rhode Island and Connecticut.

Season in Massachusetts. — (March 7) March 11 to November 7 (winter). There have been several reports of flocks of swallows in January in and near Plymouth, Massachusetts, which I have not been able to verify; many people are said to have seen them. Following is a sample: Mr. J. H. Bourne, of Marshfield, wrote me that the birds were seen four or five miles from his residence. His letter dated January 9, 1909, stated "residents living near the North River marshes report that during the warm wave early this week a considerable number of swallows were seen hovering over the marshes on several days.

PLATE 77

PLATE 77

BANK SWALLOW

Page 158

MALE

FEMALE

ROUGH-WINGED SWALLOW

Page 161

MALE

FEMALE

TREE SWALLOW

Page 153

FEMALE

MALE

JUVENAL

Allan Brooks

The old residents say they do not recall ever having seen swallows in such large numbers here in the middle of winter." If these birds were swallows, they probably were Tree Swallows, and as Tree Swallows are reported casually in winter north along the coast to New Jersey and Rhode Island, it is not so remarkable that they should also appear along the shores of southeastern Massachusetts, where in mild winters, the climate is similar to the winter climate of North Carolina. Other winter records are — Sandwich, January 27, 1924, one bird reported flying over the great marshes by John F. Carleton; Sandwich or Barnstable, February 3, 1924, one reported on the great marsh between these two towns by Osborne Earle; Naushon Island, January 13, 1929, one seen by Ralph E. Forbes.

Haunts and Habits. The Tree Swallow is quite as common as the Barn Swallow in some localities, and numerous in others. When the country was first settled, it nested in hollow trees and abandoned holes of woodpeckers, but now probably most individuals utilize bird-houses and nesting boxes, or crevices about buildings. It is not so communal in its breeding habits as are the other species, but where numerous nesting places are available, colonies of from ten to fifty pairs may be seen. It is fond of the water and many still nest in woodpeckers' holes in the dead trees killed by water in overflowed swamps.

The Tree Swallow is the first of its tribe to arrive in the north and the last to depart for the south. It is so constituted that it can subsist on berries, and, therefore, is not so closely confined to an insect diet as are other New England swallows.

Like the other swallows it follows the coast largely in migration, where it can feed on the numerous bayberries which grow there, and where it can sustain life much earlier in spring and later in autumn than it could in the interior. Mr. John A. Farley found that at Plymouth, Massachusetts, the average date for arrival for six years was March 16, and the earliest March 7.[1] Compared with a ten-year average at St. Louis of March 24, and with the earliest date at Washington, D. C., of March 28, the Plymouth dates seem remarkable. There are early dates also at Marthas Vineyard, on the Rhode Island coast and at Block Island, but the Plymouth date of March 7 is the earliest of all. The species is not recorded so early twelve to sixteen miles inland from Plymouth and it usually arrives there two or three weeks later. Even in East Carver, only seven miles inland from the Plymouth shore, as the crow flies, the arrival is much later than at Plymouth. Mr. Lester E. Pratt has given me the first arrival records there for seventeen years. The earliest is March 21, the next March 30, and for ten years the dates run from April 1 to 29, the average being about the 12th.

Usually Tree Swallows do not appear in the highlands of western and northern Massachusetts much before the middle of April, though in the river valleys stragglers may be seen earlier. With rising April temperatures and balmy airs, they appear at their breeding grounds and become interested in their former nesting places. They flutter and dart happily about in pursuit of awakened insects and all is merry until a cold storm or a sudden drop in temperature occurs, when they suddenly disappear and are not seen again until the next warm wave. The question often is asked "Where do the swallows

[1] Auk, Vol. XXXVI, 1919, pp. 577–579.

go?" Usually on cold days they go to sheltered places on the coast or to lakes or rivers where hills and trees give shelter from cold winds, and where the sun shines more warmly, — where they can still find some flying insects or can pick up benumbed ones from the water or the ice along the shore. After unseasonable cold snow-storms in late March or early April, some have been seen flying south toward the coast of Connecticut and west along that coast, as if returning to more southern states. During a long, cold storm in the breeding season they crowd together in some sheltered tree cavity, or in a bird-house with entrance turned away from the stormy wind, and there they stay until the storm has passed. For a swallow, this is a hardy bird. Mr. Arthur T. Wayne says he has seen this bird in winter on the South Carolina coast when the thermometer registered 8 to 10 degrees above zero.[1] But in spring a sudden "cold wave" in Massachusetts or a long cold storm after the winter berries have gone will sometimes decimate the ranks of these birds, as in June, 1903.

Tree Swallows ordinarily nest in some hole or cavity, or a receptacle prepared for their accommodation, but there is at least one case on record where they excavated their own homes. Mr. C. J. Maynard tells of a colony at Lake Umbagog in Maine, the individuals of which were shaping their own domiciles in partially decayed birch stubs. The work was not performed after the manner of chickadees or nuthatches, by pecking out small bits of the decayed wood, but by breaking away pieces and removing them, which they could do as the stubs were in a punky condition.

Although Tree Swallows arrive early they usually delay their nesting activities until the weather is settled and insects become plentiful. A nest with three fresh eggs that I found on April 19, 1925, on Marthas Vineyard, is my earliest record. Usually there is little nest building done by this species until the warm days of May. Both sexes aid in building the nest, and occasionally three birds, usually two males and one female, engage in preparing a nest, incubating the eggs and feeding the young. In one case two pairs were reported as using the same nest.

As with mankind it seems that their conjugal affairs do not always go well. Inconstancy is a failing common to birds as well as men. Miss Dorothy A. Baldwin, of Hardwick, Massachusetts, sends me an account of what seems like deliberate fickleness on the part of a mated female. A pair of Tree Swallows had a nest in a hollow apple tree, one of a group under which Miss Baldwin, her mother and sister were in the habit of sitting. As their seat was directly opposite the nest hole, they could watch the devoted husband bringing food to his mate in the nest. To their surprise during one of his absences another Tree Swallow, apparently an immature male with a brownish back, came to the hole and began to chatter to the female inside. She came to her door and opened a conversation with her caller, who when her husband returned beat a hurried retreat. This happened again and again. If the husband returned unexpectedly and found the stranger in close communion with his mate he fell upon the interloper furiously, while the unfaithful wife chattered excitedly in her doorway. Finally one day she was

[1] Birds of South Carolina, 1910, p. 140.

seen to come out and fly away with the stranger, never to return. Her mate mourned for a day and then he, too, disappeared, leaving the eggs cold in the deserted nest.

Like Barn Swallows, Tree Swallows seek feathers for lining their nests, and seem to prefer white ones, for they have been known to go to a distance for white feathers, when only colored ones could be found near-by. During the nesting season these birds will come for white feathers tossed in the air for them, and often one will try to carry several feathers at once, only to lose one or more at each attempt to snap up another. Where suitable white feathers are scarce, spirited combats for their possession often occur. This swallow is very pugnacious, and in the nesting season furious, long-continued battles may be seen between rival males, as well as struggles between Tree Swallows, House Sparrows, Bluebirds and Purple Martins, for the possession of nesting boxes, in which the Tree Swallow often is successful.

In some cases the young are able to fly before the end of June. Most of the adults have finished rearing their broods and have left the nesting boxes by the 10th or 15th of July, having reared their single brood. But some of the less mature birds, more tardy in coming and in mating than the adults, linger until later. The young usually are strong and well able to fly when they leave the nest, and never return to it, but in cases where they leave too soon, they may come back to it with their parents for several nights. Where the young were weak in flight, the adults have been seen to fly beneath them, as if to buoy them up. Many low flying individuals, flitting about under and among the trees in orchards, are killed by flying against wire fences. Those made of chicken-wire netting are most dangerous. At first young swallows alight on some dead limb where the adults feed them. Later as they become more proficient, they are fed on the wing by the parents, but they soon learn to catch their own insects, and then they course much over water, flying very low in cool weather, so that their wings almost touch the surface, and now and then one is caught by a large pickerel, which leaps at it from the depths below.

In August, thousands of Tree Swallows, with other species, arrive at the sea-shore where they roost in the marshes. They scatter about in the daytime, feeding on insects and berries. Their numbers continue to grow by accessions from the interior, until many thousands are gathered along the coast. Sometimes they alight on telegraph wires, covering them for miles, or they may light on the beaches until the sand is black with their hosts. When ready to migrate they sometimes rise to great heights, even beyond the reach of human vision and follow the coast southward, but if they encounter strong head winds they fly close to the ground or water to escape the full force of the blast.

This is the only swallow that habitually winters in the United States. Great numbers spend the winter near the Gulf coast, where they roost at night in large marshes and scatter over the country during the day. One of the most remarkable sights that I have witnessed was that of a vast concourse of these birds going to roost in southern Florida. Twilight was falling when, with one companion, I approached a great marsh in lower Brevard County, not far from Indian River, in what was then an unbroken wilderness.

As we came nearer, a huge black cloud drifted rapidly in from the west, and as it came over the marsh it began to roll and gyrate as if tossed about by strong, erratic winds. Then we knew that it must be a vast flight of birds. As the mass veered about over the center of the marsh, there shot down from near its center a long black tongue, forming a column which, when it reached the reed-tops, spread out with a terrific roar of wings until the whole phenomenon resembled a great black cloud connected with a black sea by a water-spout of equal blackness, and down this spout the cloud itself discharged into the marsh. When the last of the birds were down, I waded far into the marsh until I came to the edge of the roosting flock, and found the tops of the reeds covered with Tree Swallows. The next morning I was there before daylight to see them go out, but there was nothing spectacular about their departure. They merely spread out over the ground, flying low in every direction, each bird hunting insects for himself; hardly a chirp broke the silence of the morning, and in a few minutes the great flock was gone, but all that day, wherever we went, Tree Swallows could be seen in the air.

The food of the Tree Swallow differs from that of other swallows by including more vegetal matter, mainly wild berries and seeds. The fruit of the bayberry or waxmyrtle is its chief reliance when insects are hard to find, but it takes some blueberries and a few other berries including those of the Virginia juniper or red cedar and the woodbine or Virginia creeper, with a few small weed seeds and grass seeds. It takes some of the same insect pests as does the Barn Swallow, eating probably more ants and quite as many robber flies which are destructive to bees, and it seems to take about as many useful insects as the Barn Swallow.

Economic Status. It is not improbable that this bird ranks second only to the Barn Swallow in usefulness. It does no direct injury to man's products, its stay with us is longer than that of the other swallows, and probably in some places its numbers equal or exceed, at times, those of the Barn Swallow. On the other hand the Barn Swallow remains on the farm, where its utility is greatest, after the Tree Swallow has gone to the coast. The Tree Swallow is of great value about cranberry bogs and about mosquito-infested marshes.

Ripária ripária (Linnæus). **Bank Swallow.**

Other names: sand martin; sand swallow.

Plate 77.

Description. — Similar in form to Tree Swallow but smaller (smallest of our swallows) and duller in color; a small tuft of feathers on tarsus near base of hind toe. *Adults in breeding plumage (sexes alike)*: Above plain grayish-brown or mouse-brown, darkest on head, many feathers with lighter edges; flight-feathers, primary-coverts, alula and tail darker than rest of upper plumage; below white with a broad grayish-brown breast-band, rarely interrupted, across upper breast just below throat, which color continues along sides and sometimes down middle of breast; wing linings and axillars grayish-brown, with white feather-margins along edge of wing; bill black; iris, legs and feet dark brown. *Adults in winter plumage:* Similar to summer plumage, but secondaries and tertials broadly tipped white. *Young*

in first winter plumage: Similar to adults in winter, and usually indistinguishable from them. *Young in juvenal plumage:* Similar to winter adults, but light margins and tips of wing-coverts and tertials rusty or pale cinnamon, throat spotted with same, and tail feathers not barred at all but tipped grayish-white; feet "pinkish-buff," gradually becoming darker.

Measurements. — Length 4.75 to 5.50 in.; spread 10.10 to 11.10; folded wing 3.75 to 4.18; tail 1.75 to 2.35; bill .23 to .28; tarsus .42 to .50. Female smaller than male.

Molts. — Apparently the same as those of Tree Swallow (see page 154), but the postnuptial molt is later, and winter plumages of both old and young are assumed after the birds leave on their southern migration, and probably after they arrive at their winter haunts.

Field Marks. — Smallest of our swallows, brown above and on sides; wings and tail darker than back; white below with a brown band (rarely incomplete) *across breast* just below throat; flight very erratic with many twists and zigzags.

Voice. — Usually rather silent, except when danger threatens; call notes, more harsh and "gritty" than those of other swallows; "song," a mere twitter.

Breeding. — On high shores of the sea, on precipitous islands, and the steep banks of lakes and rivers, or anywhere not too far from water where suitable banks may be found. *Nest:* A chamber about 5 inches in diameter, lined with grass and feathers, at the end of tunnel in bank, from 15 inches to 8 feet or more in length. *Eggs:* 3 to 7; .63 to .83 by .45 to .55 in.; usually ovate; white with a rosy or pinkish tinge when fresh; figured by E. A. Capen in "Oölogy of New England," Plate VI, Fig. 14. *Dates:* May 28 to June 17, Massachusetts; May 29 to June 24, Maine. *Incubation:* Period 12 or 13 days (F. L. Burns); probably by both sexes. One or two broods yearly.

Range. — North America, Central America, South America, Europe and a great part of Asia and Africa. In North America breeds in Boreal and Austral zones from northern Alaska, central Yukon, northwestern Mackenzie, Melville Island, Franklin Island (casually), northeastern Manitoba, northern Ontario and northern Ungava (Quebec) south to southern California, Arizona, southern Texas, Louisiana, central Alabama and southern Virginia; in migration south through Central America and West Indies (casually); winters in South America from Colombia and Venezuela to Brazil and Bolivia; in the Old World breeds from about 70° north latitude south to Tunisia, Algeria and east to Siberia, Syria and Palestine; extreme limits of breeding range not well known; south in winter to eastern and southern Africa and to India.

Distribution in New England. — Common migrant and common local summer resident, wherever suitable banks may be found. Most common in Maine, where cut banks are more numerous than in the other states.

Season in Massachusetts. — April 12 to September 8 (November 2).

Haunts and Habits. The little brown Bank Swallow is not only the smallest of our swallows, it is the only one that has not learned to nest about man's buildings or other structures. It prefers to dig its own hole. Like the Tree Swallow it often arrives much earlier along the coast, especially in southeastern Massachusetts, than in the interior, but it has not been recorded along shore until after the first of April, and usually it is not found in any numbers in the interior until May. From the coast it follows up the rivers, usually arriving in their valleys before it appears on the higher lands, for the high shores of the ocean and the cut banks along river shores are its normal breeding places. When the birds arrive they retire at night to sleep in their last year's holes, or they quickly excavate new ones, far enough into the bank to give them shelter for the night. In delving into the bank they cling to it, and peck the dirt out with their bills, but when the holes are deep enough for them to enter, they use both bills and feet.

When a hole becomes too deep to throw dirt out with the feet, it is carried out in the mouth. In sandy, friable soil only a single row of holes is made near the top of the bank, and each hole runs slightly upward, so that the nest is just beneath the sod, which keeps the roof from caving in. In clayey soil, however, the bank may be honeycombed with several irregular rows of holes. When a bank is formed of stratified layers of clay, sand and gravel, the nests may appear spaced almost as regularly as the windows of a factory, as only certain strata are used by the birds. Some Bank Swallows burrow in great heaps of sawdust, left by lumbermen, but these heaps must be unsafe nesting places.

The holes usually approach a circle in section and are about two inches in diameter, but some are much wider than their height, as if both the mated birds who excavated the apartment had worked side by side. Usually they work into the bank only two or three feet, but in gravelly soil they have been known to go in eight or nine feet to find a place without small stones, which might fall on the nest. When they find stones too large for them to dig around, they abandon the attempt and try again elsewhere. The Rev. F. O. Morris, who has watched the work of this species in England, says that a pair of these birds will remove about twenty ounces of sand in a day and that they can move pebbles two ounces in weight. The time occupied in making the burrows depends upon the kind of soil, the obstructions encountered and the length of the burrow, and may therefore vary from a few days to a few weeks. In favorable localities where they are undisturbed hundreds of pairs may nest in company.

After the young are hatched, the parents brood and feed them frequently. In about ten days they are ready to leave the nest and they are then cared for by the male, while the female often prepares the nest for another brood.

Notwithstanding the apparent inaccessibility of their nests, there are enemies that are able to enter them. Sometimes an entire colony is destroyed by a mink or a weasel which somehow succeeds in climbing to their burrows. Those foreign interlopers, the House Sparrow and the Starling, sometimes drive out the Bank Swallows and utilize the burrows for their own nests. Occasionally a river in flood undermines a bank, and the nests go down in an avalanche of sand, or when, as is frequently the case, the Swallows utilize a sand pit for their nesting place, teamsters carting out sand may destroy their home, and bird-nesting boys must be reckoned with; then there is that danger that all swallows must face at times — the continued prevalence of cold rains in the nesting season. Many colonies have been exterminated at such times where the rains have been heaviest. The poor birds then huddle together in their holes, and being unable to find food, they perish, as many did in June, 1903. Fortunately, however, there are always areas where there is less rain and cold than in the sections of extreme precipitation, and in those areas some Swallows always survive. By August 15 both first and second broods are strong upon the wing, and migration has begun.

The food of the Bank Swallow does not differ materially from that of the other swallows. It shows a similar fondness for flies and destroys many of the weevils and other pests taken by the Barn Swallow and the Tree Swallow.

Economic Status. This species may not be quite so useful as the three previous species, as it does not nest so habitually in the neighborhood of farms and gardens.

Stelgidópteryx serripénnis (Audubon). Rough-winged Swallow.

Contributed by Dr. John B. May.

Plate 77.

Description. — Resembling Bank Swallow in color and form, but larger, more uniformly colored above, and lower fore parts tinted, but not banded; basal joint of middle toe adherent to the outer, and outer web of 1st primary converted into a series of small hooks (these not appreciably developed in young birds); under tail-coverts of male longer and broader than those of female; no tuft of feathers at base of hind toe. *Adults (sexes alike)*: Above mouse-brown or brownish-gray; below lighter brown on chin and throat, darkening slightly on upper breast, sides and flanks, gradually whitening posteriorly on abdomen and under tail-coverts; bill black; iris, legs and feet dark brown. *Young in first winter plumage:* Similar to adults. *Young in juvenal plumage:* Similar to adults, but lighter in color; wing-coverts broadly tipped and tertials broadly margined and tipped (except on inner webs) with fawn-color; tinged with cinnamon on throat and upper breast.

Measurements. — Length 5.00 to 5.75 in.; spread 11.50 to 12.25; folded wing 3.95 to 4.90; tail 1.95 to 2.35; bill .25 to .30; tarsus .40 to .42. Female smaller than male.

Molts. — Similar to those of Tree Swallow (see page 154); molting takes place after the bird has left New England.

Field Marks. — Somewhat larger than Bank Swallow; similar in color above, but more uniform; wings and tail nearer the color of back, where those of Bank Swallow are darker; throat and chin brownish instead of white and no clearly defined brown band across upper breast as in Bank Swallow. Flight heavier or more deliberate than that of Bank Swallow; not so erratic and with more gliding and sailing.

Voice. — A twitter somewhat similar to that of Bank Swallow; "three or four weak notes, *zeetle-tzeet* repeated at irregular intervals" (Grinnell and Storer); "a call note sounding like '*trit*,' often doubled to '*trit-trit*,' or prolonged to '*tri-ri-ri-rit.*'" (A. A. Saunders).

Breeding. — Usually near water. *Nest:* In hole in bank, cliff, tree, bridge or building or even in an open drain-pipe in a stream-bank; nest more bulky than that of Bank Swallow, otherwise similar; lined with grasses, rootlets, bits of dead leaves, pine needles and (very rarely) feathers. *Eggs:* 4 to 8; like those of Bank Swallow, but averaging a little larger; about .72 by .52 in.; oblong; glossy white, unmarked; figured by E. A. Capen in "Oölogy of New England," Plate VI, Fig. 15. *Dates:* May 2, Virginia; May 6 to June 9, Connecticut; May 7 to June 8, Massachusetts; May 16, Vermont. *Incubation:* No details. One brood yearly.

Range. — North America from southern border of Canadian Zone southward, and Central America. Breeds in Austral and Tropical zones from southern British Columbia, Idaho, northern Montana, central North Dakota, central Minnesota, central Wisconsin, central Michigan, southeastern Ontario, central New York, central Vermont and southern New Hampshire south to Lower California, Nayarit, northern Jalisco, Puebla, Vera Cruz, southern Texas, southern Louisiana, southern Alabama and northern Florida; winters from Sinaloa and Vera Cruz in central Mexico, south through Central America to Panama; casual in Manitoba and in northern Michigan.

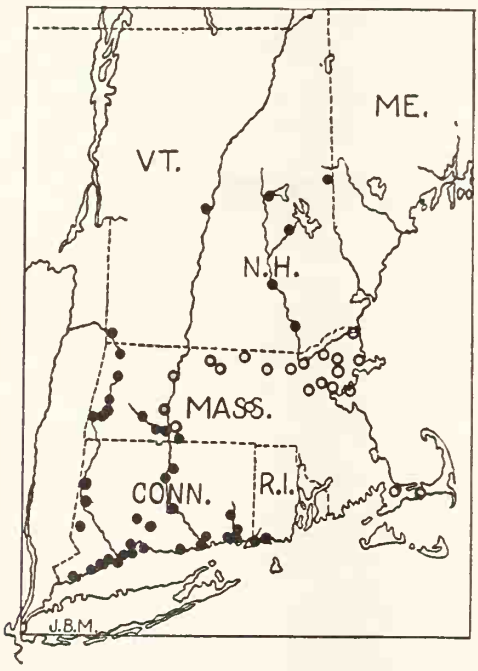
Distribution in New England. — *Maine:* Not recorded. *New Hampshire:* Rare summer resident in southern portion; Boscawen, July 3, 1909, nest found by F. I. Martin;[1] Winnisquam, May 14, 1913, 3 or 4 pairs breeding;[2] Ashland, June, 1917, one pair breeding;[3] Manchester, July, 1923, nest found by A. F. McGowan;[4] Snowville, July 17, 1925, nest found by Miss Grace M. Snow.[5] *Vermont:*

[1] Martin, Fred I.: *in litt.*
[2] Webster, Miss Ellen S.: Bird-Lore, Vol. XVII, 1915, p. 293.
[3] May, John B.: *in litt.*
[4] Martin, Fred I.: *in litt.*
[5] Snow, Miss G. M.: *in litt.*

Rare summer resident in southern portion; Norwich, May 6, 1905, pair breeding;[1] Bennington, July, 1906, pair breeding;[2] St. Johnsbury, June 8, 9, 21, 1918, a pair seen by Miss Inez A. Howe.[3] *Massachusetts:* Rare migrant in eastern half; rare summer resident in western portion; apparently increasing slowly. *Rhode Island:* Rare migrant and summer resident; Westerly, June 3, 1917, three nests, Charlestown, 1929, one nest, all found by Harry S. Hathaway.[4] *Connecticut:* Fairly common local summer resident along coast and in river valleys.

Season in Massachusetts. — Late April to September.

Haunts and Habits. The Rough-winged Swallow is the rarest of the six species of *Hirundinidæ* found in New England. While it probably breeds in every state of the Union except Maine, it is not considered common in any of the northeastern states. Thirty years ago there was only one authentic record of this species north of Connecticut, that of a couple of pairs which Mr. Walter Faxon found breeding at North Adams in 1895. Since that time, however, either the species is increasing in numbers and extending its range to the northeast, or it is being identified more frequently because there are more good field observers studying our birds than in former years. It requires a quick eye to detect, as the birds wheel and pass in rapid flight, the slight differences which distinguish the Rough-winged Swallow from the Bank Swallow or the immature Tree Swallow.



Breeding Distribution of the Rough-winged Swallow in New England with Migration Records in Massachusetts.

The Rough-wing may be recognized in its chosen haunts by a careful observer, as it courses rather slowly over a stream, pond, marsh or field, seeming to follow an established route over and over, its direct flight showing little of the rapid zigzagging characteristic of the slightly smaller Bank Swallow. It is not as communal in its nesting habits as the latter bird and it is seldom that more than a few pairs occupy any given locality. It is also much more catholic in its choice of a nesting site than is the Bank Swallow, the latter always excavating its own nest burrow, while the Rough-wing sometimes digs its own tunnel, sometimes uses that of a Bank Swallow or a Belted Kingfisher, often nests in the crannies of a ledge or in the crevices of a bridge or mill foundation, and even at times uses an open tile drain in a river bank.

[1] Blake, Francis G.: Auk, Vol. XXIV, 1907, p. 103.
[2] Ross, Dr. Lucretius H.: *in litt.*
[3] Vermont Botanical and Bird Clubs, Joint Bulletins Nos. 4 and 5, 1919, p. 25.
[4] Hathaway, Harry S.: *in litt.*

Photograph by Dr. John B. May

FIG. 76. — NESTING BURROW OF ROUGH-WINGED SWALLOW

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Photograph by C. E. Leister

FIG. 77. — NEST AND EGGS OF YELLOW-THROATED VIREO

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The accompanying map, showing the location of breeding records of this bird in New England, indicates that its limit of range coincides very closely with that part of the Transition Zone which, theoretically, should show traces of the typical Carolinian fauna. Definite breeding records are confined principally to the southern coastal area and to the valleys of the Housatonic, Connecticut and Thames rivers in southern New England. A few stations are found on tributaries of the Hoosic River which flows westward into the Hudson near the southwestern corner of Vermont.

Eastern Massachusetts has no authentic nesting records but the species is seen every year in Essex County and occasionally in migration in Plymouth and Barnstable counties. A bird was observed repeatedly, during the summer of 1903, over a small pond in Groton, but no nest was located.[1] On May 18, 1929, Dr. Charles W. Townsend and Mr. S. G. Emilio watched a pair of these birds carrying straws to a burrow in a gravel bank in Middleton, but the nesting place was disturbed and deserted before the eggs were laid.[2]

There are breeding records from five stations in New Hampshire, all but one in the Merrimack River water-shed, while the fifth, a somewhat isolated station, is at Snowville, the farthest north and east that this bird has been found breeding, and close to the boundaries of the Pine Tree State.

My first experience with the Rough-winged Swallow was at Clark's Pond in Ipswich, Massachusetts, on May 21, 1916. In company with Mr. Charles B. Floyd and the late Barron Brainard, I was watching a mixed flock of swallows hawking about over the pond, when Mr. Brainard called our attention to two birds which he recognized, from past experience in their nesting haunts in Berkshire County, as Rough-winged Swallows. They were seemingly following a clearly defined aërial pathway, down a shallow gully to the pond, out over the water, then back across a swampy field to the upper end of the gully, and repeating this trip over and over. By crouching in the gully we could watch the birds as they passed close overhead, and were able to identify them beyond question, and to compare them with Bank Swallows. As this was the first record of the bird in Essex County we were much elated.[3]

About six weeks later, as I was paddling my canoe down the Asquam River in Ashland, New Hampshire, my attention was drawn to a pair of swallows zigzagging back and forth across the swamp close by. I at once decided they were Rough-wings, but it was impossible to follow them among the flooded thickets of the marsh, and they soon disappeared from sight. As this was such a brief view I could not feel absolutely certain of my identification until, exactly a year later, two birds were again seen at the same place, and this time they very accommodatingly perched on a dead twig in good light only a few yards from my canoe. The brownish throat, shading off into grayish below, was plainly visible, and in flight the back and wings were a nearly uniform brownish color, while the wings of the Bank Swallow are noticeably darker than its back.

I immediately began a search for a nesting site and soon located it in a low under-cut

[1] Hill, Miss Elizabeth S.: *in litt.* [2] Emilio, S. G.: *in litt.*

[3] May, John B.: Bird-Lore, Vol. XVIII, 1916, pp. 371, 372.

bank just across the narrow stream, thus establishing a new record of the farthest northeastern breeding locality of the bird. The nest was in a burrow a foot or so from the top of the bank, apparently an unfinished and abandoned Kingfisher's hole. The entrance was very different from the small opening made by Bank Swallows, and was large enough to admit my hand readily. By reaching in until my elbow was within the hole I could just touch the nest lining, which was made principally of grasses, but I could not reach the eggs without digging out the hole which would probably have caused the birds to abandon the nest. (See Fig. 76.)

A week or so later I returned to the locality, armed with a camera and a small dipnet used in fishing. Both parents were busily engaged in feeding their young, entering the burrow at frequent intervals, their throats distended with insects. After watching them for some time, I allowed one parent to enter the burrow and then slipped the dipnet over the opening, easily catching the bird when it started to leave the nest. Its mouth was filled with long-legged insects which it was feeding to the young when disturbed. Holding the bird in one hand and the camera in the other I took several portraits, then examined the stiff barbs on the first primary feather, which give the bird its distinctive name, and which are very easily felt by running the finger along the feather-edge. I hoped that a colony would form around this nest, but the next summer the river was unusually high, the bank was undermined and the nesting place destroyed, and I never identified the birds again in that neighborhood.

The food of the Rough-winged Swallow is probably different in no essential way from that of other New England swallows. Like the Bank Swallow it is usually found near streams, hence its food is largely made up of aquatic insects, mosquitoes, etc., and it fills a slightly different niche than the Barn and Eave Swallows, the latter destroying many house flies and other domestic insects.

Economic Status. Although undoubtedly a useful bird this swallow is not common enough in New England to be of much importance.

Family **BOMBYCILLIDÆ**. Waxwings.

Number of species in North America 2; in Massachusetts 2.

This well-known family is distinguished by a soft, silky, blended plumage, a short, broad, rather obtuse bill, notched near tip of each mandible, no bristles about the mouth, a long conspicuous crest on the head, and long pointed wings with secondaries, sometimes tertials (and sometimes tail) tipped with appendages resembling red sealing wax. There are ten primaries, but the first is spurious — so short as to escape notice. The tail is short, rather narrow and nearly square-tipped or very slightly wedge-shaped, the legs and feet are rather short and weak, and the plumage is soft and beautiful, though not brightly colored.

PLATE 78

PLATE 78

CEDAR WAXWING
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ADULT MALE

BOHEMIAN WAXWING
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ADULT MALE

JUVENAL

NORTHERN SHRIKE
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ADULT MALE

IMMATURE

MIGRANT SHRIKE
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ADULT MALE

Allan Brooks

Bombycílla gárrula (Linnæus). Bohemian Waxwing.

Plate 78.

Description. — *Adults in highest plumage (sexes alike)*: Soft drab above, becoming gradually more reddish-brown about fore part of head, and more gray below; pure gray or ashy on secondaries, rump and upper tail-coverts, and slaty-gray on tail, which becomes slaty-black toward end, where broadly and conspicuously yellow; forehead (narrowly), lores, line through and behind eyes and around back of head, chin and throat black, bordered narrowly and briefly on sides of throat and below eye by white; secondaries broadly tipped white on outer webs, and ornamented (as also one or two tertials) at ends with red appendages (rarely yellow), which also sometimes appear on end of tail; primary-coverts and primaries slaty-blackish, narrowly edged slate-gray, the former broadly tipped white; outer webs of primaries yellow or white toward ends, inner webs sometimes also with narrow tips of yellow or white; lower abdomen and region about vent whitish; under tail-coverts chestnut or cinnamon-rufous; bill black, lighter or flesh-color at base; iris dark brown; legs and feet black. *Young male in first winter and first breeding plumage:* Like adult, but flight-feathers browner, without white edges on inner webs; some of wax tips missing. *Adult female in imperfect plumage:* Somewhat duller, usually more grayish on back, no yellow on wing, or less yellow than in adult male. *Young in juvenal plumage:* Similar to adults, but duller, more brown above and heavily streaked below; few or no waxy appendages, and smaller crest; chin grayish with some dusky spots; middle of abdomen white and outer tail-coverts paler than in adult.

Measurements. — Length 7.40 to 8.75 in.; spread 13.15 to 14.25; folded wing 4.36 to 4.75; tail 2.50 to 3.00; bill .43 to .51; tarsus .60 to .75. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt, including body plumage and wing-coverts; flight-feathers and tail retained; this plumage worn through first summer; adult winter plumage assumed by complete postnuptial molt; adults have but one (complete) molt (October, November); there is little change in plumage during the year, although it may fade slightly in summer.

Field Marks. — Size somewhat smaller than Catbird; can be confused only with Cedar Waxwing, but has white markings on wings (which Cedar Waxwing always lacks); is larger; gray below where the other is yellow, and has *chestnut under tail-coverts* at all ages.

Voice. — Alarm note *tzee-tzee;* no song known; flock made a loud twittering noise (Sir John Richardson). A very silent bird while in New England.

Breeding. — In northern forested regions. *Nest:* On branch of tree, often many feet from ground; built of rootlets, twigs, grass stems and bark-strips or lichens and lined with hair, down or feathers. *Eggs:* 3 to 6; .80 to 1.06 by .65 to .70 in.; * usually ovate; bluish-gray or greenish-slate to stone-color, spotted with various shades of dark brown or blackish; distinguished from those of Cedar Waxwing only by larger size; figured by Henry Seebohm in "A History of British Birds," 1885, Plate 11. *Dates:* June 15, British Columbia; June 18, Labrador; July 13 to 30, Alberta. *Incubation:* No data.

Range. — Boreal and Temperate regions of North America. Breeds in coniferous forests of Boreal zones from northern Alaska, Yukon, northern Mackenzie and northern Manitoba south to northern Washington and northwestern Montana; winters from southern Mackenzie, northern Ontario, southern Quebec and Nova Scotia south irregularly to southern California, Colorado, Kansas, central Oklahoma, central Missouri, southern Illinois, Indiana, Ohio, Pennsylvania, New Jersey, Long Island (New York) and Connecticut; casual in Arizona. In Europe the bird breeds in northern Scandinavia and northern Finland; south in winter to Germany and rarely to Italy.

Distribution in New England. — Rare, irregular winter visitor.

Season in Massachusetts. — September 11 to March 18 (April 26).

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* These measurements include eggs of European birds, which are larger than American specimens, and which probably belong to a different race.

Haunts and Habits. The history of the Bohemian Waxwing in Europe contains several records of its occurrence in prodigious multitudes. We have knowledge of only one such occurrence in the United States. Professor Spencer F. Baird quotes "Mr. Drexler" who says that while in a winter camp of the South Pass wagon road party, at the head of Powder River, Nebraska, every tree for miles was filled with them, and that their numbers rivalled those of a flock of "wild pigeons." McIlwraith reports the irregular occurrences of vast flocks in Canada West.[1]

This species is in many ways one of the most interesting and remarkable of American birds. The roving character of its life, the mystery, only imperfectly solved, of its habits and nidification, its almost cosmopolitan distribution in America, Europe and Asia, and its irregular appearance in winter, together with its almost unique and lovely coloration, all tend to create an unusual interest in the bird. Recently its breeding grounds in the Northwest have been discovered. In New England it is not quite so rare as former published records indicate. Some years ago I called attention to the fact that it seemed to be making yearly visits to this territory. Ornithologists were inclined at first to be skeptical, but after Mr. Horace W. Wright had actually seen a living specimen, he took enough interest in my records to investigate them, and later he published a paper largely composed of records from my correspondence.[2]

Anyone who knows the ordinary markings that distinguish our two species of waxwing will have no difficulty in recognizing the Bohemian Waxwing at sight. This is a case where sight records by capable observers, who have every opportunity of inspecting the birds, are unquestionable. I have many records of the Bohemian Waxwing in New England obtained since Mr. Wright's article was written, which are still unpublished. Lack of space will prevent their publication in this volume.

The haunts and habits of the species in New England are much the same as those of the Cedar Waxwing in winter. The two species are sometimes seen in company and they feed on the same food. Therefore the food of the Bohemian Waxwing while with us consists mainly of such winter berries as those of the mountain ash and the sumacs. In the far north they feed on the Alpine arbutus and marsh blueberries.

Economic Status. The Bohemian Waxwing is of no importance in New England, but during spring and summer in its northern home it is said to be a great insect destroyer.

Bombycílla cedrórum Vieillot. Cedar Waxwing.

Other names: cedar-bird; cherry-bird.

Plate 78.

Description. — Formed like Bohemian Waxwing, but without conspicuous white or yellow wing markings. *Adults in highest plumage (sexes alike)*: Narrow band crossing forehead above bill, widening on lores and narrowing behind eye, velvety black, contrasting sharply with a pale line above it on upper

[1] Coues, Elliott: Birds of the Colorado Valley, Part First, 1878, pp. 463, 464 and 466.
[2] Auk, Vol. XXXVIII, 1921, pp. 59-78.

forehead and a white or whitish stripe below it; chin black, fading gradually into color of throat; rest of head, neck, upper breast and back "pinkish-brown," or slightly purplish-cinnamon, passing gradually into gray on rump, upper tail-coverts and tail, and finally into blackish-slate on tail (which is tipped yellow), and passing also into olive-yellow on posterior part of sides and abdomen (paling on latter); *under tail-coverts white or whitish;* on wing-coverts the body color gradually darkens and becomes grayer, the primaries becoming slate-gray (some partially edged light gray); secondaries and often one or two tertials tipped with appendages resembling in color red sealing wax; inner margins of tertials light gray, wing linings and axillars also pale or light grayish. *Adult female in imperfect plumage:* Similar to female in highest plumage, but chin usually with less black, yellow tip of tail narrower and no red appendages on tips of secondaries. *Young in juvenal plumage:* Similar to adults but grayer, crest much shorter, lighter about head and rump, no black behind eye or on throat, and streaked on back and below alternate buffy or whitish and brownish.

Measurements. — Length 6.50 to 8.00 in.; spread 11.00 to 12.25; folded wing 3.50 to 4.00; tail 2.25 to 2.75; bill .27 to .45; tarsus .66 to .70. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (September, October), involving body plumage and wing-coverts, after which young birds become virtually as adults. Adults have but one molt (postnuptial, September, October), which is complete.

Field Marks. — Size, slightly larger than Bluebird. *Adults:* Long-crested, brownish birds, graying on wings and tail and lightening to yellow below on flanks; tip of dark tail yellow; black about eyes and on chin; *under tail-coverts white or whitish;* no other bird at all like it except Bohemian Waxwing (see page 165).

Voice. — A "wheezy lisp" (Ralph Hoffmann), resembling the syllables *see see*, much prolonged; some claim to have heard the bird sing; Mr. William Brewster recalled a series of loud, full notes, rather mellow and not unlike some spring notes of Tree Swallow, he suspected, however, that these were cries of alarm or apprehension; "low, warbling notes, scarcely audible twenty feet away" (N. S. Goss); young birds have a louder call than adults.

Breeding. — In orchards or anywhere among scattered trees. *Nest:* In orchard, shade or forest tree, either deciduous or coniferous, often in apple tree or Virginia juniper, rarely in bush, from 4 to 40 feet from ground on nearly horizontal branch; bulky and rough externally, composed of twigs, weed stems, bark-strips, plant down, plant fibers, leaves, fine rootlets, rags, paper, twine, etc., lined with the finer of these materials and sometimes with horsehair or wool. *Eggs:* 4 to 6; .80 to .89 by .60 to .70 in.; usually ovate; dull pale bluish, greenish-slate or yellowish-gray, spotted freely with black or blackish and brown, with some under-markings of purplish; figured by E. A. Capen in "Oölogy of New England," Plate VII, Figs. 2, 3 (the examples there shown are not of the usual bluish type), and by A. R. Dugmore in "Bird Homes," Plate B, Fig. 12. *Dates:* June 20 to August 1 (August 20), Connecticut; May 30 to late August, Massachusetts. *Incubation:* Period 12 to 16 days; by both sexes. One or two broods yearly. Mrs. Myra Dunn, of Phillipston, Massachusetts, reports three broods, with small naked young in the third nest September 13, 1922. This bird is a late breeder, young of the last brood having been hatched in Massachusetts as late as September 19, according to H. W. Copeland.

Range. — North America and Central America. Breeds in Canadian, Transition and Upper Austral zones from southeastern Alaska, central British Columbia, southwestern Mackenzie, northern Alberta, north-central Saskatchewan, central Manitoba, northern Ontario, south-central Quebec and Cape Breton Island south to northwestern California, southern Oregon, northern New Mexico, northern Oklahoma, Kansas, northern Arkansas, eastern Tennessee and southwestern North Carolina; winters from southern British Columbia, southern Ontario, southern Quebec and Nova Scotia (casually) south through nearly all of the United States to Cuba, Mexico, Central America and Panama; recorded in Bermudas, Bahamas, Little Cayman, Jamaica and England.

Distribution in New England. — Common migrant and summer resident, except at higher eleva-

tions, less common in winter, and seen chiefly then in southern and central New England; very rare, irregular or absent in winter in extreme northern New England.

Season in Massachusetts. — Resident throughout the year.

Haunts and Habits. Who can describe the grace and elegance of this bird? What other common bird is dressed in a robe of so delicate and silky a texture? Those shades of blending beauty — velvety black brightening into fawn, melting browns, shifting saffrons, quaker drabs, pale blue-gray and slate, with trimmings of white and golden-yellow, and little red appendages on the wing-quills not found in any other family of birds — all, combined with its symmetrical form, give it an appearance and distinction peculiarly its own. Its erectile crest expresses every emotion. When lying loose and low upon the head it signifies ease and comfort. Excitement or surprise erect it at once, and in fear it is pressed flat.

"At any time of the year," writes Dr. Coues, "in almost any part of the country, one may hear some curious wheezing, lisping notes, and, on looking about him, may see a dozen or a hundred little birds in sight, flying in an easy, rather undulating course, to alight in a compact body on the nearest tree, where they remain silent and motionless for a few moments, drawn up to their full heights, displaying their long top-knots; then they begin to move about and feed, unless some alarm sends them off to another tree. When the cedar ripens its glaucous-blue berries, these same birds are sure to be found there, gorging themselves on this fruit till they are literally choke-full — the last few berries sticking in their capacious throats for want of room below." Again he says: "Our satiny Waxwings offset their gluttony and indolence with some nice, amiable traits. They are tender-hearted, affectionate birds, fond of each other, and quite capable of showing a degree of heroism in their devotion to one of their number, who may be in difficulty." [1]

Observations of the bird's habits confirm this estimate of its character. The Cedar Waxwing is a very affectionate bird. Bradford Torrey asserts that he saw two hopping about on a flat stone and pausing every moment or two to put their little bills together.[2] Several may be seen at times pluming and caressing one another. Dr. T. M. Brewer tells us that when one of a pair was caught in a net spread to protect fruit, its mate refused to leave it, and even suffered itself to be taken in the hand, and when liberated would not leave until its mate was free to go with it.[3]

Mr. Charles J. Anderson wrote me that on June 12, 1922, the Cedar Waxwings about his home in Springfield, Massachusetts, became so noisy and excited that Mrs. Anderson went out to discover the cause of their trepidation. She could find nothing wrong at first, but they still appeared much troubled. When she returned to the house the birds followed her almost into the door. Finally she heard something flutter behind a trellis, where she found one of the birds swinging by its neck, which had become

[1] Coues, Elliot: Birds of the Colorado Valley, Part First, 1878, pp. 472, 473.

[2] Torrey, Bradford: Birds in the Bush, 1885, p. 126.

[3] Baird, Brewer and Ridgway: A History of North American Birds, Land Birds, Vol. I, 1905, p. 403.

entangled by a piece of fine twine so that it was hanging from the trellis. She released the half-strangled bird and it finally flew away.

Cedar Waxwings are such gluttonous birds that they sometimes become so surfeited as to be unable to fly, and have been known to fall helpless on the ground. At least one instance is on record where a bird of this species was supposed to have died from overfeeding. Whether in such cases the victims are suffering from gluttony or from intoxication, caused by the fermented juices of over-ripe fruit, does not always appear, but in the following account sent to me by my young friend John Willison, the behavior of the birds was attributed to the latter cause : —

"One warm day last fall, I was walking with a chum through the fields and woods at Manomet Point, Plymouth, Massachusetts, (the woods to which I refer were situated directly behind the Mayflower Inn at Manomet Point). Suddenly my friend, who knew nothing about birds, pointed to a twenty-foot chokecherry tree, which was loaded with birds, and asked what those birds were. I told him that they were Cedar Waxwings. As we drew closer the birds looked as though their feathers had been drawn or brushed the wrong way, and I realized that something was wrong with them. The birds did not seem to notice us and we soon came near enough to easily catch them with our hats. All the while the birds were eating the berries ravenously. My companion was soon in a fit of laughter. 'Why, they're drunk!' he exclaimed. Sure enough, the birds were evidently intoxicated by the over-ripe chokecherries. Their actions were very comical, for they were helpless. One fellow bobbed up and down even after we had secured him under my hat. Their crests were erect and in the excitement of seeing us they all tumbled around. Some tumbled to the ground where with outspread wings they attempted to run away; still others tottered on the branches with wings continually flapping, as though for balance. All the time we were there they kept up a continual hissing noise, as a family of snakes might do. We caught several to inspect, and finally left them in peace."

All through the spring the Cedar-birds loiter about with nothing on their minds and nothing to do but to eat and grow fat. Many of them even allow early summer to pass before they begin to prepare for family cares. They are rather slow in mating, but at nest-building are very diligent. They will use cotton, rags or string in place of the ordinary vegetal fibers; usually when string is accessible they prefer white and sometimes blue to other colors of twine or yarn. Both male and female work together at their loving task, taking material wherever they can find it; sometimes they even steal some from the nest of some other bird. Mr. Adelbert Temple, of Hopkinton, Massachusetts, informs me that on as late a date as August 29 he found a Cedar Waxwing sitting on her four eggs in a Robin's nest, which she had taken for her own use without adding to it any new material. This probably was an abandoned nest which she was using for her second brood.

Miss Florence A. Merriam tells us in "Birds Through an Opera Glass" how a Cedar Waxwing, in Northampton, Massachusetts, adopted some young Robins whose mother

had been killed, and fed them as if they had been her own. Both male and female of the Cedar Waxwing care for and feed their young and attend them assiduously. The young leave the nest in from twelve to sixteen days.

Like some other plump and well-fed personages, the Cedar Waxwing is easy going, happy, and blessed with a good disposition. It is fond of good company. When the nesting season is past each harmonious little family joins with others until the flock may number from thirty to sixty individuals. They keep well together through the winter and spring until the nesting season again arrives. Their manner of flight is quite their own. They fly in close order, and often they suddenly wheel, as if at command, and plunge swiftly downward, alighting in a compact band on the top of some leafless tree.

In spring and summer they are fond of bathing in the brooks and there some individuals will come very close to a quiet sitter. Mr. A. A. Cross, of Huntington, Massachusetts, tells me that while he was trout-fishing on a rock in midstream, one of these birds alighted twice on his rod within a foot of his hand, and later one lit on his hat.

The seasonal movements of the Cedar Waxwing appear to be rather erratic. There seems to be a southward movement in August and September when the majority of the species leave New England but if there is a bountiful supply of wild fruit of the kinds which persist during the winter many birds remain here associating in flocks of various sizes, and so perhaps, in the white days of winter, you may see a little flock sitting upright upon some leafless tree, the birds calling softly to one another in their high-pitched, lisping, sibilant monotone. As Mr. W. L. Dawson says in his "Birds of Ohio," "It is as tho you had come upon a company of the Immortals, high-removed, conversing of matters too recondite for human ken, and who survey you the while with Olympian disdain."

Usually during the latter part of the winter there is an early northward movement of these birds, most of which disappear before the end of April, but the main flight does not appear before May and sometimes quite late in that month.

"So," says Dr. Coues in his "Birds of the Colorado Valley," "they lead their idle, uneventful lives — these *débonnaire* birds, sociable but not domestic, even a trifle dissipated, good-natured enough to a friend in a scrape, very reliable diners-out, and fond of showing off their dressy top-knots, on which so much of their mind is fixed."

The food of the Cedar Waxwing consists very largely of fruit, but most of it is wild fruit of no value to man. The Biological Survey finds that nine-tenths of its food for the year is vegetal matter — almost wholly wild fruits and seeds. The animal food consists mainly of insects. When Cedar Waxwings first come in spring, they may be seen pecking at the blossoms of fruit trees and scattering the petals broadcast, but when their stomach contents have been examined, quantities of insects that infest blossoms have been found, with very few petals or stamens. They are fond of small moths, leaf-eating beetles and curculios, and devour quantities of the Colorado potato beetle and the pernicious elm-leaf beetle, which has proved very destructive to elms recently in the eastern states. Mr. Outram Bangs informed me that Waxwings entirely cleared his

young elms of the latter pest. Mrs. Mary Treat notes a similar instance, and the late J. M. Van Huyck, of Lee, Massachusetts, informed me that in 1911 this species "absolutely cleared" of this pest some trees in that town.[1]

The Cedar Waxwing is very fond of the small geometrid caterpillars that strip the foliage from apple trees, elms and other trees, and it destroys enormous quantities of these worms. Professor S. A. Forbes estimates that a flock of 30 of these birds will eat 90,000 canker-worms a month — a very moderate estimate, for the appetite of the birds is unlimited. At times they are almost equally destructive to tent caterpillars. The young are fed quantities of insects and as they grow older the parents give them some fruit. The food is usually carried in the gullet of the parent until regurgitated into the open mouths of the little ones.

I watched the Cedar Waxwings in a canker-worm year, when all through the orchards the little "inch-worm" caterpillars began to cut holes in the leaves. Then came the eager birds in flocks and there they stayed, often whispering to one another and always catching worms. Such gourmands as they were! They ate until they could eat no more, only to sit about on the branches or play with one another awhile, and then eat again. The canker-worms stripped a few of the old trees, but the Waxwings cleared most of them and saved the leaves, thereby saving the fruit also. When the cherries were ripe these birds always found them. They stayed in the cherry trees with the same persistence that they showed in their work with the canker-worms. They have a habit, when satiated, of sitting together, sometimes five or six on the same limb, all facing the same way, and at such a time I have seen a cherry or a caterpillar passed from one to another until it had passed up and down the line before one would eat it.

In late summer and early fall the Cedar Waxwing turns to flycatching, and taking its post on some tall tree, usually near a pond or river, launches out over water or meadow in pursuit of flying insects. Birds taken at such times have been found crammed with insects to the very beak. Grasshoppers, crickets, crane-flies, lace-wings, butterflies, moths, bugs, bark-lice and scale-insects form part of their bill of fare, with occasionally a few snails.

Sometimes the flycatching habit is exercised even in winter. Mr. Brewster notes that on March 1, 1866, in Watertown, Massachusetts, he saw the members of a large flock busily catching snowflakes. They took their station on the branches of a tall elm, from which they launched forth in quick succession and snapped up the whirling flakes.

These birds seem to do little injury to cultivated fruit except the cherry crop, and most of this usually may be avoided by planting a number of early mulberry trees when planting cherries. In my own orchard the mulberries attracted almost all birds away from the cherries. The best varieties of mulberries to plant are the early Russian, and the New American.

In late summer, autumn and winter their vegetal food consists largely of wild cherries, blackberries, raspberries, mulberries, pokeberries and such other wild fruit as that of the

[1] Forbush, E. H.: The Utility of Birds, Massachusetts Department of Agriculture, Bulletin No. 9, 1922, p. 29.

Virginia juniper or red cedar, mountain ash, buckthorn, hawthorn, barberry, privet, bush cranberry, sassafras, flowering dogwood, nightshade, honeysuckle, mistletoe, black gum and hackberry. The fruit of asparagus, frozen apples, thorn apples, rose hips, sunflower seeds, and the small varieties of wild grapes also are taken. In the spring migration the persistent berries of the holly are eaten; rarely the bird has been known to attack pears, strawberries and crabapples.

Like some other birds the Cedar Waxwing seems to enjoy the sweet sap of the sugar maple, from which it takes an occasional drink. It takes sap from the birch also, when opportunity offers.

Economic Status. Professor Beal examined the stomach contents of 152 Cedar Waxwings, in an attempt to get some idea of their economic status. As a result of this work, supplemented by observation in the field, he concluded that the bird was a useful species and should be accorded all possible protection.[1] Nevertheless hundreds of the birds are shot each summer by growers of small fruits. The principal injury done by them affects the cherry crop, although they eat some currants and raspberries. A cherry grower in Vermont had on one side of his orchard a row of trees bearing soft early cherries which would not stand shipping, and which could be used only for the local trade. When the trees came into bearing Cedar Waxwings, or Cherry-birds, as he called them, gathered from all quarters, and in spite of the measures that he took to protect his crop, they practically ruined the fruit on those trees. This they continued to do for about three years, when in despair he cut down the entire row. The next year the birds attacked his more valuable fruit, which the early fruit had previously protected. If the cherry grower, when planting an orchard, would first set out a row of soft early cherries or early mulberries around his orchard, and allow the birds to take the fruit from those trees, he might thereby save the main crop of later, harder and more marketable fruit. This plan has been successful in New York State.*

Family **LANIIDÆ**. Shrikes.

Number of species in North America 2; in Massachusetts 2.

Shrikes though typically passerine in structure are very strongly built, and their bills are so modified as to somewhat resemble those of birds of prey. The bill of a shrike is stout, notched, toothed and hooked, "combining bill and claw in one." This member stamps a shrike at once as predatory, as it is evidently intended for tearing flesh. Otherwise the members of this family qualify as strong, hardy and robust song birds. They have a superficial resemblance to jays and mockingbirds and are sometimes mistaken for

[1] Beal, F. E. L.: Some Common Birds in their Relation to Agriculture, United States Department of Agriculture, Farmers Bulletin No. 54, 1897, p. 32.

* Much of the above biography was originally written in different form for a leaflet published by the National Association of Audubon Societies in "Bird-Lore," and more recently included in a volume entitled "Portraits and Habits of our Birds," edited by Dr. T. Gilbert Pearson.

them by people not well versed in the subtleties of ornithology. In the Old World shrikes have been marked birds for centuries, and their spirit, courage and prowess have bespoken for them such unwilling admiration as is always accorded to the power and daring of rapacious birds. In ancient times the shrike was known as the "Nine-killer," under the belief that he killed and hung up his victims until nine could be counted. His habit of hanging his prey on thorns may be merely a provident way of storing food, but the bird leaves many victims thus impaled to which he never returns.

Economic Status. Those who have investigated the food of shrikes in America regard them as unquestionably beneficial to agriculture. Dr. S. D. Judd, who made rather an exhaustive investigation for the United States Department of Agriculture, Dr. B. H. Warren, former State Ornithologist of Pennsylvania, and Mr. Charles W. Nash, author of the "Birds of Ontario in Relation to Agriculture," all agree that the injurious insects and mammals destroyed by shrikes considerably exceed in importance the value of useful birds and insects taken by them.

Lánius boreális Vieillot. Northern Shrike.

Other names: great northern shrike; butcher-bird.

Plate 78.

Description. — Bill large and strong, upper mandible notched (toothed) and hooked, lower mandible slightly hooked, nostrils nearly circular, overhung by strong bristly feather-shafts, which also surround the large mouth; head relatively large; neck short; body stout; wings and tail ample, about equal in length and well rounded; legs and feet large and strong, but without the unusually strong toes and long curved claws of the ordinary bird of prey. *Adult male in breeding plumage:* Above light bluish-gray, fading to white or whitish on rump and upper tail-coverts, along outer margin of scapulars and around lower forehead, the white running back over eyes and ear-coverts; broad stripe extending from base of bill or near it (nearly surrounding eye), to upper ear-coverts, black; wings and tail chiefly black or blackish, but lesser wing-coverts colored like back; wings marked broadly with white at tips of tertials and secondaries, tips of primaries very narrowly edged same, and a patch of white showing near bases of primaries; outer tail-feather on each side mostly white, with some black toward base, chiefly on inner web; second tail-feather has black more extensive, but base and end white, from this to the middle feathers extent of white tips gradually decreases; sides of head below black stripe and all lower plumage white or whitish, with wavy, narrow, dusky-gray barring beginning faintly on lower throat and extending over breast and sides (some have little barring); bill black, lightening to bluish on posterior half in summer (Allan Brooks). *Adult male in winter plumage:* As adult male in summer, but no black before eye; colors not quite so bright and pure; *bill dark brown, becoming flesh-color toward base;* iris dark brown; legs and feet black. *Immature male (second year):* Similar to adult male but duller, gray above often tinged more or less olive; primaries and secondaries browner and worn, white of upper tail-coverts replaced more or less by grayish, and wings and tail showing less white; wavy barring below much more distinct and extending up more on sides. *Young male in first winter plumage:* Resembling adult male, but duller and browner above and below; lesser wing-coverts leaden-grayish; some wavy barring on lower rump and upper tail-coverts; dark stripe extending from eye over ear-coverts (but not before eye) dusky or brownish-black; white of wings and tail more restricted and more wavy barring below. *Adult female:* Similar to adult male in color and markings, but often duller, and with less white on both wings and tail. *Young female in first winter plumage:* Similar to young male in same plumage, but still browner,

and white tips of wings and tail usually more buffy. *Young in juvenal plumage:* Much like young in first winter plumage but browner above, more fine wavy barrings above, extending from lower back to end of tail-coverts, and on posterior scapulars; sides of breast pale buffy-grayish, finely and faintly barred darker.

Measurements. — Length 9.00 to 10.75 in.; spread 13.50 to 16.60; folded wing 4.35 to 5.00; tail 4.00 to 4.70; bill .70 to .76; tarsus .90 to 1.05. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (September, October) including tertials, wing-coverts and tail; first breeding plumage by partial prenuptial molt (February, March) about the head and but little elsewhere, throat becoming whiter; adult winter plumage by complete postnuptial molt (late July to September); adult breeding plumage by partial prenuptial molt, as in young. Possibly another year is required (at least in some cases) to produce highest plumage.

Field Marks. — About Robin size, a large-headed, thick-set, rather long-tailed bird, with upper mandible slightly hooked; somewhat resembling Mockingbird in markings, but with a broad black or dark stripe through or behind eye and less white on wings. *Adult male:* Light gray or light brownish-gray with black, white-marked wings and tail, and faintly barred breast. *Female and young:* Similar but much browner.

Voice. — Calls, when attacking a bird on the wing, shrill note like sound of tin whistle (C. L. Whittle); "a harsh shrieking *jo-ree*" (O. W. Knight); cries resembling those of a small bird in distress; song, a loud, continuous carol, with many variations and brief pauses or intermittent, often somewhat resembling that of the Catbird; sometimes interspersed with scraping notes or with squalls and screeches, resembling those of mice or small birds; sometimes continued without any long pause for half an hour; in some cases the scolding note of the Robin is used, and this Shrike can imitate the Robin's song.

Breeding. — In northern forests. *Nest:* In thorny bush or on limb or fork of tree, from 5 to 20 feet up; large and compactly built, composed of twigs and leaves, thickly lined with fur, down, feathers, lichens, etc. *Eggs:* 4 to 7; 1.05 to 1.10 by .75 to .80 in.; oval; whitish, bluish-gray or greenish-gray, with markings of greenish or light brown and purple or grayish. *Dates:* April 26, Fort Anderson, Mackenzie; June 11, southern Quebec; June 7, northern Alberta. *Incubation:* Period probably about 15 days. Normally one brood yearly, two may occur.

Range. — Northern North America south to the southern United States. Breeds in Hudsonian and Canadian zones from northwestern Alaska, northern Mackenzie, northern Manitoba, northern Ontario, northern Ungava (Quebec) and Labrador south to base of Alaska Peninsula, central Saskatchewan, southern Ontario, southern Quebec and (casually) New Brunswick; winters from southern British Columbia, southern Manitoba, southern Ontario and southern Quebec south to California, Arizona, New Mexico, Texas, northern Arkansas, Kentucky and Virginia; accidental or casual in North Carolina.

Distribution in New England. — Rather irregular migrant and winter resident; common at times, but often uncommon, and rare or local in some seasons.

Season in Massachusetts. — October 6 to April 18 (May 21).

Haunts and Habits. A lonesome bird, more solitary than the eagle, this "Butcher of the North" comes to us in the wake of the smaller land birds, when increasing frosts denote the approach of winter. While here he hunts alone, frequenting broad uplands, sparsely wooded swamps, orchards and fruit gardens — in fact any place where small birds or mice congregate. He enters villages and cities in pursuit of the House Sparrow and Starling, and he follows the winter birds wherever they may be found. His usual watch tower is the top of some tall tree, telegraph pole or wire, or even the top of a small tree or a post, where he often sits upright like a hawk, scanning the ground below. Any unfortunate mouse, bird or insect hiding there is then in danger from this sharp-eyed

butcher who, on perceiving his prey, descends like a plummet, rarely missing his aim. Sometimes he leaves his perch and hovers over his prey for a few seconds, as does the Sparrow Hawk. He occasionally jets his tail while sitting, or even in flight, which usually is slightly undulating, but is very direct when in pursuit of birds.

Apparently he has no love for his own kind, and is sufficient unto himself, and though we may deplore his attack on the smaller birds, we can but admire his self-reliance, audacity and courage. Though ordinarily rather wary, when in pursuit of his prey he is as fearless as a Goshawk. He attacks birds as large as himself, and even larger. Blue Jays, Robins, Pine Grosbeaks and the redoubtable Starling are among his victims, though the Blue Jay does battle with him and oftentimes escapes when aided by its companions. The Starlings mob the invader with enthusiasm tempered by caution, following in a compact flock above him, using the same tactics as with a hawk, but the undaunted butcher usually carries off his selected prey.

If the victim is a bird, the Shrike usually goes with it to the ground, kills it by a few blows on the head and then commonly takes it to some tree or bush, where he either hangs his victim on a thorn, suspends it by the head in the crotch of a branch, or places it between two contiguous branches, where it is held by twisting one leg among forked twigs. Having thus hung up his prey securely the butcher, if hungry, proceeds to flay the breast and devour it. Often the stomach and lungs are eaten, sometimes only the head, and in some cases nearly the whole bird. If the Shrike is not suffering the pangs of hunger he may leave his victim hanging. In such a case one has been known to attack a flock of Tree Sparrows, kill three, one after the other, and hang them all. Professor E. H. Eaton quotes the late Mr. Austin F. Park, who watched a Shrike while it was catching two House Sparrows, one of which it hung on the prong of a lightning rod on the top of a tall chimney, about 140 feet from the ground.[1] Usually, however, the prey is left in a bush or low tree or even upon the barbs of a barbed-wire fence. The evident objects of this habit are to fasten the bird so that the Shrike, whose feet are not so strong relatively as those of a hawk, can tear off its food with its stout bill, and in case it does not need the victim at once for food, to preserve it "for future reference." Many times, however, the rapacious bird kills and suspends more victims than it can use, as insects, birds and even mice are sometimes left to dessicate or decay.

The Northern Shrike usually catches its birds on the wing, either by rising above them and plunging swiftly downward or by sheer persistent speed. While following a bird on the wing it follows every twist and turn of the victim, whose only chance is to outspeed its pursuer and climb higher and higher. In this way some small birds escape. Others get away safely by being able to dodge at sharp angles to their line of flight, when the eager pursuer having attained its best speed has its prey almost within its grasp. Then its superior weight and momentum carry it so far past the fleeing quarry that the latter obtains a good lead, and by repeating this manœuver may gain some sheltering thicket, impenetrable to the larger bird.

[1] Eaton, E. H.: Birds of New York, New York State Museum, Memoir 12, Vol. II, 1914, p. 361.

In bearing away its prey the Shrike uses either bill or claws, whichever are most useful, and sometimes in conveying unusually heavy game, it fastens on it with both bill and claws, and laboriously flutters off with it. In pursuit of its quarry it is so fearless that it often dashes against windows or into rooms to attack caged birds. Nuttall relates an instance where one tore off the head of a Canary, which in its fright at the vicious attack of the larger bird had thrust its head out between the wires in its efforts to escape. Shrikes are so impetuous that they not infrequently are stunned by dashing against windows in their pursuit of cage birds. Mr. Frank Novak, of Birdcraft Sanctuary, Connecticut, saw one dash against a wire fence in pursuit of a Chickadee which passed safely through one of the meshes, while its intrepid pursuer rebounded and fell to the ground as if dead.

Shrikes frequently attack small birds at feeding stations at the very windows of houses and often in pursuit of their prey enter the traps of bird banders. In such cases they are so fearless that they are driven away with difficulty. Usually when the small birds see a Shrike, they remain motionless, if not perceived by him, until the danger is past. But once I saw a Northern Shrike in a bush surrounded by a small band of complaining Chickadees. The Shrike had been singing previously and its peculiar notes may have attracted the little birds.

Practically all birds are mimics. Young birds learn to imitate the notes of their parents, or if confined where they cannot hear the voices of their own kind they imitate the notes of other birds, or mimic such other voices as may appeal to them. But shrikes seem to be blessed with unusual powers of mimicry. One day Mr. Wm. C. Wheeler, who can imitate many bird songs, whistled the song of a Robin as he approached a Northern Shrike. The bird immediately mocked his rendition of the song, and repeated it after him thrice. Nuttall says that in some parts of New England the Northern Shrike is called the Mockingbird, and he asserts also that this shrike sometimes imitates the notes of other birds, and that his friend "Mr. Brown" had heard one mimic the quacking of a duck so closely that the ducks answered "as to a decoy fowl." Wittingly or unwittingly the Northern Shrike imitates the songs of such common birds as the Robin, the Catbird and the Song Sparrow.

Notwithstanding all the above, the food of this species consists very largely of mice and insects. It is true that in New England in winter, when deep snow covers and protects the mice, and when the larger insects are mostly unobtainable, it feeds chiefly on birds — but this occurs only during a few months of the year. All through the spring, summer and autumn, so long as insects are abundant they are the chief food of the Northern Shrike. When the contents of the stomachs of Shrikes taken in autumn or early spring are examined many destructive beetles, grasshoppers, crickets and moths are found.

Economic Status. All economic ornithologists who have investigated the food of this species regard it as a useful bird. John Muir tells an experience of his own which

illustrates the utility of shrikes in destroying rodent pests. He saw a shrike go down into a gopher hole and drive out half a dozen young gophers, and hovering over one after another as they ran, it killed them all by blows delivered from its powerful bill on the back of each one's head.[1] However, it destroys many small birds during its winter sojourn in New England, and bird lovers are prone to regard it as does Mr. W. L. Dawson, who says in his "Birds of Ohio," "No doubt, too, our northern brigand would eat mice or grasshoppers by preference, and does when opportunity offers, but it is no fault of ours that we cannot set such viands before his butchership in winter, so that he must needs fall to eating our Juncoes and Goldfinches. The slaughter of Horned Larks and the terrorizing of an innocent band of Tree Sparrows are offences not easily forgiven. Have at thee, Sirrah! My gun is loaded!"

Nevertheless this useful Shrike is protected by law.

Lanius ludoviciánus mígrans W. Palmer. Migrant Shrike.

Other names: BUTCHER-BIRD; GRASSHOPPER HAWK.

Plate 78.

Description. — Similar to Northern Shrike, but smaller, darker gray above and unbarred below. *Adults (sexes alike or similar)*: Above slaty-gray, darkest on top of head, fading into paler gray on scapulars and upper tail-coverts, sometimes becoming nearly white on outermost scapulars, paling narrowly in a line around lower forehead and extending backward above a broad black stripe which runs narrowly around base of forehead and widens from base of upper mandibles through eye and over ear-coverts; wings and tail black or blackish; wings marked white on inner bases (marginally) and tips of secondaries and bases of all primaries but outermost; tail with white ends on all but two middle pairs of tail-feathers (one pair of latter usually have small white spots at tip), the white increasing rapidly in amount from inner to outer pair which latter are about half white; below plain pale gray, fading to white or whitish on throat and chin and to pure white on side of head below black stripe; iris dark brown; bill, legs and feet *black* or dusky. *Immature in first breeding plumage:* Similar to adult, but somewhat duller; wings and tail worn and brown and some slight wavy barring below. *Young in first winter plumage:* Similar to first breeding plumage, but with a tendency to drab above; below dull whitish with rather faint wavy barring, throat darker. *Young in juvenal plumage:* Above brownish-gray; below lighter; marked above and below with inconspicuous narrow, wavy bars of darker gray; wings and tail blackish-brown; wing-coverts tipped pale brownish-gray, forming two wing-bars; otherwise white markings of wings and tail disposed much as in adult, but white not so pure; the usual dark bar through eye.

Measurements. — Length about 9.20 in.; spread 12.50 to 13.00; folded wing 3.75 to 4.00; tail 3.60 to 4.00; bill .53 to .57; tarsus about 1.00. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt involving chin, throat and head, and a few scattering body feathers; adult winter plumage by complete postnuptial molt (September) and adult breeding plumage by prenuptial molt as in young.

Field Marks. — Size, larger than Catbird. Adults difficult to distinguish from other shrikes in the field, *slaty-gray above*, with white markings on blackish wings and tail, and a wide *black stripe from bill through eye; smaller and darker above* than the Northern Shrike, and *unbarred below*, though some show slight barring there; bill entirely black below (pale at base in Northern Shrike); in spring barring of

[1] Muir, John: The Story of My Boyhood, 1913, pp. 195–198.

Northern Shrike wears away from feather-tips, and the novice might mistake it then for Migrant Shrike with faint barring; latter indistinguishable in field from Loggerhead Shrike. *Young:* Difficult to identify various shrikes in the field, but any Shrike seen in southern New England in August may safely be set down as a Migrant Shrike.

Voice. — Uusual note a harsh *jo-ree;* also harsh *y-e-e-a-a;* song like that of Catbird or Brown Thrasher, but harsher and lower (O. W. Knight).

Breeding. — In farming country, especially where thorn bushes grow. *Nest:* In group of trees, in hedge-row, bush or orchard tree, from 5 to 20 feet from ground; bulky and "composed of rootlets, twigs, twine, rags, feathers and grasses, lined warmly with feathers and wool" (O. W. Knight). *Eggs:* 4 to 8; .94 to 1.00 by .69 to .75 in.; very variable in shape and coloration; nearly oval to short ovate; white to grayish or greenish-gray, some covered with obscure purplish-brown or olive markings, others have beside these, more distinct markings of similar colors arranged around large end; some are little marked, except by heavy spots at large end; figured by E. A. Capen as eggs of Loggerhead Shrike (before the two races were separated) in "Oölogy of New England," Plate VII, Figs. 11, 12. *Dates:* April 26 to May 5, Virginia; May 21, Pennsylvania; April 26 to May 5, New Hampshire; May 5 to 25, Maine. *Incubation:* Period 13 to 16 days (O. W. Knight); chiefly by female, but male said to assist. One or two broods yearly.

Range. — North America chiefly east of the Great Plains from southeastern Canadian Provinces to the Gulf of Mexico. Breeds mainly in Transition and Upper Austral zones from Minnesota, northern Wisconsin, northern Michigan, southern Ontario, southern Quebec, Prince Edward Island and New Brunswick south to eastern Oklahoma, Arkansas, Tennessee, western North Carolina and southern Virginia (locally in the East), and west to eastern Nebraska and eastern Kansas; winters from Missouri, southern Illinois, southern Indiana, southern New York and southern New England south to Texas, Louisiana, Mississippi and Alabama.

Distribution in New England. — *Maine:* Rather uncommon local summer resident, but increasing. *New Hampshire:* Uncommon local summer resident in lower lands. *Vermont:* Uncommon local summer resident. *Massachusetts:* Rare migrant; rare summer resident in western part; very rare in winter in southeastern part. *Rhode Island:* Rare migrant. *Connecticut:* Rare migrant; rare winter resident; possibly accidental summer resident.

Season in Massachusetts. — March 28 to April 17 (summer), August 21 to November 27 (winter).

Haunts and Habits. My chief recollections of the Migrant Shrike picture a gray bird sitting on a telephone wire where he could scan the scenery and from which he occasionally descended swiftly to pick up an unlucky grasshopper. The Migrant Shrike is a bird of the farm, the orchard and the hedgerow. It prefers the neighborhood of thorny trees or bushes on which it can transfix its victims. When hungry, of course, it eats them at once, but when its appetite is satiated it hangs them on thorns, nails or barbed wires, and leaves them there, sometimes for future reference, but often for good. Its habits are much like those of its larger relative, the great Northern Shrike, except that it is not so destructive to small birds. Its notes and song also resemble somewhat those of the larger species. The Migrant Shrike is the only one of the family that is known to breed in New England. It is rather remarkable, however, that it is not positively known to nest in central or eastern Massachusetts, Rhode Island, Connecticut or New Jersey, although it breeds in New York, Pennsylvania and Virginia. It is not easy to account for its uneven distribution.

Although two broods in a season have been recorded often, the species does not seem

to increase and spread rapidly, yet it follows clearing and settlement to a certain extent, and appears to be disseminating slowly in the East. Probably many individuals are shot by people who have observed shrikes killing small birds.

The food of the Migrant Shrike consists very largely of mice and the larger species of destructive insects, such as grasshoppers, crickets and caterpillars, moths, butterflies, large beetles and cicadas. The bird also kills some small birds, shrews, frogs and snakes.

Economic Status. The investigations of the Biological Survey indicate that the Loggerhead Shrike (of which the Migrant Shrike is the northern phase) is a beneficial species, and economic ornithologists seem generally to agree on this point.

Family **VIREONIDÆ.** Vireos.

Number of species in North America 12; in Massachusetts 6.

Some authors formerly referred to vireos chiefly as "greenlets." The name *vireo*, derived from the Latin, indicates a green bird, and all the New England species are more or less greenish above, so both vireo and greenlet may be considered appropriate as applied to the species treated in this volume. Vireos are song birds, closely related to shrikes. The bill varies in size but is usually much shorter than the head. The upper mandible is notched and slightly hooked at tip; the nostrils are exposed and overhung with a scale; the bill is widened at base, and the mouth fringed with bristles. Here the birds show some affinity to the flycatchers and because of this feature they have been known as "warbling flycatchers." The wing has ten primaries, the first extremely short (spurious) and is always longer than the tail which is rather short, nearly even, with rather narrow feathers. The *front toes* are connected with each other from base to first joint. The coloration of the entire family, which consists of many species, all American, varies considerably, but the colors are plain without conspicuous streaking anywhere. The members of this family are arboreal, nesting chiefly in trees and suspending their nests to the horizontal forks of twigs or branches. They feed chiefly on insects and more or less on wild fruit.

Economic Status. Vireos as a group are regarded as very beneficial. They are destructive to caterpillars, both hairy and hairless, and probably few if any native birds consume so many leaf-rollers as are destroyed by members of this family. A full account of the food of North American vireos will be found in Department Bulletin No. 1355 of the United States Department of Agriculture, by Edward A. Chapin of the Bureau of Biological Survey.

Vireosylva olivácea (Linnæus). **Red-eyed Vireo.**

Other names: red-eyed greenlet; preacher.

Plate 79.

Description. — Shape typical of the vireos (see Family *Vireonidæ* above). Primaries apparently only 9, the 10th being rudimentary and usually so concealed as to be overlooked. *Adults (sexes alike):*

Top of head mouse-gray, bordered on sides by narrow line of dusky or black; rest of upper plumage chiefly grayish-olive-green; broad stripe of pale grayish or whitish over eye; streak through eye dusky-gray before eye, darkening when near the eye, and becoming rather less distinct and more dusky behind it; sides of head beneath this streak pale olivaceous or pale brownish-olive; below grayish-white, sides and flanks tinged pale yellowish-olive; wing linings pale sulphur-yellow, and under tail-coverts tinged same; bill brownish, blackish or bluish-black above, often paling basally and below, especially at base; *iris red;* legs and feet pale bluish-lead-color. *Young in first winter plumage:* As adults, or difficult to distinguish from them, except by color of iris which is *brown* while these birds remain in New England. *Young in juvenal plumage:* Above, including top of head, vinaceous-brown, varying from pale brown to fawn-color or drab; greater wing-coverts edged and tipped pale olive-yellow; flight-feathers and tail as in adults; iris brown; "bill and feet pinkish-buff becoming slaty" (J. Dwight).

Measurements. — Length 5.50 to 6.50 in.; spread 9.75 to 10.75; folded wing 3.10 to 3.30; tail 2.10 to 2.34; bill .56 to .66; tarsus .63 to .70. Female averages slightly smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September) involving body plumage, wing-coverts and sometimes tertials; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (August, September); adults have but this one molt annually.

Field Marks. — Size near that of Song Sparrow, but tail shorter and not rounded. *Adults:* Greenish above, with dark cap with a black line along the edge, a white stripe above eye, a black stripe through it, and no wing-bars; white below (which often appears gray in shade of trees which bird frequents) passing into pale yellowish or buffy-olive on sides and flanks. *Young:* Similar but more brown above. Warbling Vireo is similar to adult Red-eyed Vireo, but smaller, paler, grayer above, and side of head not distinctly striped; Philadelphia Vireo also similar, but head not distinctly striped and under plumage largely dull yellow.

Voice. — Alarm notes a *chip*, a *chatter*, and rather harsh, low, long-drawn complaining cries, having something of the quality of the Catbird's alarm note, "*we-an* or *ye-an* with the French nasal N" (W. L. Dawson); "a harsh scolding '*wheree*' of anger" (O. W. Knight); a complaining nasal *whang* (F. M. Chapman). *Song:* a halting, interrupted, musical soliloquy, often resembling slightly in tone the Robin's song. Nuttall gives a succession of the bird's phrases, thus: *'tshoŏe peweĕ peeaĭ musik 'du 'du 'tshoŏve 'hĕre here, hear hère, 'k'ing ritshard, 'p'shegrŭ, 'tshevŭ, 'tsheevoo'tshŭvee p e e a it 'pèroi;* phrases also given as follows, *wêe chewêo turrullit chêweeo* (E. A. Samuels); *vireo vireo viriee vir-a-viree* (P. L. Hatch).

Breeding. — Normally and chiefly in woods or forests, mixed or deciduous growths preferred, but sometimes in orchard or shade trees. *Nest:* At various heights from 4 to 50 feet, usually low in tree or shrub but suspended in a fork of some small nearly horizontal branch or in fork of twigs; a neat, durable, pensile cup, composed of bits of birch and other bark, strips of paper from wasps' or hornets' nests or of man's manufacture, fine grasses, leaves or other vegetal fibers, lined with finer similar material and some times with hair, bound together with spiders' or caterpillars' webs. *Eggs:* 2 to 4, usually 3 or 4; .78 to .95 by .48 to .65 in.; ovate or elongate ovate; white, sparsely spotted, chiefly around large end, with dots and spots of brownish-black, and some lighter brown spots; figured by E. A. Capen in "Oölogy of New England," Plate VII, Figs. 4, 5. *Dates:* May 15 to 30, Virginia; June 1 to 12, Connecticut; May 25 to July 20, Massachusetts; mid-June to mid-July, Maine. *Incubation:* Period 12 to 14 days (F. L. Burns); by both sexes. Normally one brood yearly, sometimes two, especially in the south.

Range. — North America, Central America and northern South America. Breeds in Canadian, Transition and Austral zones from central British Columbia, southern Mackenzie, central Manitoba, northern Ontario, southern Quebec, and Anticosti and Cape Breton islands south to northern Oregon, central Nevada (casually), southern Montana, Wyoming, central-western Texas, northern Coahuila, southern Louisiana, southern Alabama and central Florida; migrates through Mexico, Yucatan and Central America (casually Bermudas, Cuba and Bahamas); winters from Costa Rica and Colombia to Peru, Bolivia and southern Brazil; accidental in Greenland and England.

PLATE 79

PLATE 79

WARBLING VIREO
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PHILADELPHIA VIREO
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RED-EYED VIREO
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YELLOW-THROATED VIREO
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BLUE-HEADED VIREO
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WHITE-EYED VIREO
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Allan Brooks.

Distribution in New England. — Common migrant and common summer resident in most of the region.

Season in Massachusetts. — (April 23) May 2 to October 14 (October 26, November 2 and 5).

Haunts and Habits. Throughout the long hot summer days the Red-eyed Vireo sings. He begins with the Robin at early dawn, but in time the Robin tires. Not so the Red-eye. His singing is a part of the game. He sings as a matter of course, with little apparent exertion, almost unconsciously, thus expending his pent-up energy in a most pleasing and cheerful manner. He uses short phrases intermittently, but continually, from morn till night unless interrupted, and he sings much of the time from spring to autumn. The song is so continuous, so much like the Robin's in quality, and harmonizes so well with the murmur of the breeze among the trees, and the bird is so well hidden by the leaves, that it is commonly passed, unnoticed, by the uninterested observer, though it is one of our most common birds, and its song may be heard during the summer more often than that of any other.

Wilson Flagg named it the "Preacher," because of its elocutionary powers and continuous discourse, with short pauses, as if to give the listener time to reflect. He seemed to hear it say: "You see it — you know it — do you hear me? do you believe it?" and these words really give some idea of the *tempo* and style of the bird's "preaching," if we remember that each phrase is given with a rising inflection at the end. Let no one imagine, however, that our bird sits and prates in idleness. My attention was first drawn to the food of birds and their usefulness to agriculture and forestry when, in my early boyhood, I watched a Red-eyed Vireo singing in a swampy thicket. I recorded the incident in the following words: "He sang a few notes, his head turning meanwhile from side to side, his eyes scanning closely the near-by foliage. Suddenly the song ceased; he leaned forward, sprang to another twig, snatched a green caterpillar from the under side of a leaf, swallowed it, and resumed the song. Every important pause in his dissertation signalized the capture of a larva. As the discourse was punctuated, a worm was punctured." [1] The seeming carelessness and idleness of the bird are deceptive. Deliberately and carefully he scans leaf and twig, searching out protectively colored insects which some other bird might pass unnoticed, but never he. It is astonishing to see him detect and capture caterpillar after caterpillar where the human eye fails to discern them. Caterpillar hunting, not singing, is his serious business. Rarely some flying insect tempts him to leave his perch, and he launches forth and captures the fleeing creature with all the address of a flycatcher.

Now and then the Red-eyed Vireo utters a peculiar song resembling that of some other bird. I have record of one that added to its own song notes similar to those of the White-eyed Vireo, and of another that sang in September a very faint imitation of the song of the Catbird. In singing the bird keeps mainly to the upper part of trees, but sometimes descends to the shrubbery.

This is by all odds our most common vireo of the woodlands. As farms and villages

[1] Forbush, E. H.: Useful Birds and Their Protection, 1905, p. 205.

have taken the place of primeval forests, however, the bird has adapted itself to the new conditions, until it has become common wherever trees grow, even in cities. It was a common bird in Boston streets in my boyhood days, before the House Sparrow came.

The Red-eyed Vireo is not likely to become common in southern New England until after the middle of May. The males arrive first, some few very early in the month. There are a number of reports of April arrivals, which may be doubtful. Courtship begins as soon as the females arrive, but I have observed no unusual antics, although the males exert themselves to please the females with song and attention. There is much chattering and fluttering about in pursuit of prospective mates. The male is a good husband and father, not infrequently assisting in nest building, commonly relieving the female on the nest, and when the young arrive, bringing at least his share of the food, and often the larger part.

The nest is a neat and handsome little basket and very durable. Like that of the Baltimore Oriole, one will last two or three years. Nest building ordinarily requires about a week, but if storms intervene, or if the birds must go a long distance to secure the material, or if the summer days are unusually hot, more time may be required. When much exposed to a hot sun in securing material for their nest, the birds may work only during the cooler part of the day. In the heated hours they prefer the woodland shades. If the nest building is too long delayed the female may be compelled to deposit her eggs and begin incubation before the nest is completed. Then the male attends her gallantly, bringing nesting material which she arranges and weaves in place as she sets upon the eggs. Deposition of the eggs before the nest is finished is not uncommon among birds, but not every male bird will assist the female in such an instance.

Among the chief enemies of the vireos we must reckon the Blue Jay and the Cowbird. The Cowbird sometimes deposits several eggs in the nest of the Red-eyed Vireo, and where Cowbirds are plentiful the first brood often consists of one or more Cowbirds, so that if they are to raise any young of their own, they must nest again late in the season. Dr. T. M. Brewer reports that a pair of these birds raised a brood of three Cowbirds without the female Vireo ever laying any eggs of her own. Occasionally a pair may raise two broods in a season. Mr. A. A. Cross, of Huntington, Massachusetts, reported that on September 15, 1918, he saw one feeding young barely able to fly. When the Blue Jay finds the nest he rifles it of eggs or young, whether Cowbirds' or Vireos' — "they all look alike to him." Once a pair of Blue Jays found the nest of a Red-eyed Vireo in the woods near Mr. William Brewster's cabin at Concord, Massachusetts, and disregarding the feeble attempts of the little birds to drive them away, the marauders greedily ate their precious eggs. Then the smaller birds came to us as if for protection, and built their nest so near the cabin door that the opening portal, as it swung, barely missed the dainty fabric, and there the young were safely fed and raised. The male faithfully took his turn on the nest during a part of the day, singing quite constantly while attending to the duties of incubation. This is a common habit among vireos, and the song often leads the observer to the nest.

When the eggs are hatched, the parents are very attentive in their care, whether the young are Cowbirds or their own offspring. During a tempest, accompanied by torrential rains, a male Red-eyed Vireo was seen to join his mate on the nest, and there the devoted pair sat side by side in that driving, tempestuous downpour, sheltering the tender young beneath their wings. The parents will often defend their brood, regardless of their own safety. Mrs. Emily S. Fowler wrote to me that as she reached for a branch on a spruce tree that held a nest of this species, the parent bird, presumably the female, flew, scolding, almost into her face, and when she had bent down the branch so she could see into the nest in which were their downy young ones, the brave little bird dashed at her hand, lit on it and pecked and bit it — the hand of a grown woman wearing a large and fearsome hat! Then the bird flew to the farther rim of the nest and stood guard over it, as Mrs. Fowler slowly raised the branch to its natural position. As the visitor quietly backed away, the bird stepped into the nest, and covered her treasures, all the time facing the intruder with her large fearless eyes. Others have related similar experiences, but only certain individual birds show such courage as this. This species sleeps very soundly with its head tucked under its wing — so soundly that by careful approach it may be taken by hand.

When the young are able to fly well, and when in late summer the berries in pastures and swamps are ripening, the whole family resorts to these localities, and early in September the migration south begins.

In the choice of food the Red-eyed Vireo shows a strong preference for insects. It destroys many kinds of forest caterpillars, not disdaining the hairy kinds, such as the forest tent caterpillar, the tent caterpillar and the larva of the gipsy moth. It eats moths and butterflies of many kinds, large and small grasshoppers, locusts, katydids, horse flies, mosquitoes, gnats, tree-borers, bark-beetles, leaf-beetles, tree-hoppers and other bugs. In late summer and autumn it takes quite a quantity of wild berries, among them blueberries, raspberries, blackberries and the fruit of the cornels, benzoin, sassafras and magnolia; pokeberries, wild black cherries and wild grapes are eaten in small numbers. Mr. Arthur T. Wayne says that the controlling influence upon the autumnal migration of this bird in South Carolina is the fruit of the magnolia, which begins to ripen the first week in September, many seeds remaining in the cones until November. The seeds contain much oil and birds feeding on them become very fat. Mr. Wayne says that he has often counted as many as fifty of these birds in one tree.[1] All through the South, wherever this tree fruits, the vireos grow fat upon the seeds, and formerly in Louisiana many of them were killed for the table under the name of "grassets."

Economic Status. The Red-eyed Vireo is regarded universally as one of our most useful birds. Apparently it injures none of man's products, and it destroys quantities of noxious insects. Its capacity for such food is so great that one young bird has been known to eat 100 grasshoppers in a day.

[1] Wayne, Arthur T.: Birds of South Carolina, 1910, p. 144.

Vireosylva philadélphica Cassin. Philadelphia Vireo.

Other name: BROTHERLY-LOVE VIREO.

Plate 79.

Description. — Similar in form to the Red-eyed Vireo, but smaller and bill relatively shorter; spurious primary not apparent. *Adults (sexes alike or similar)*: Above grayish-olive-green, more decidedly grayish on top of head, head marked much as in Red-eyed Vireo, but very indistinctly; wings and tail dark brownish-gray, with lighter olive-green margins, but no noticeable wing-bar; below very pale sulphur-yellow, passing into whitish on chin and abdomen; wing linings and axillars pale yellow; bill brown or horn-color, darkening at tip, paling on edges and below to light bluish-gray; iris brown; legs and feet bluish-gray. *Young in first winter plumage:* Practically indistinguishable from adult. *Young in juvenal plumage:* Above olive-brown, paler on head, nape and rump; below pale primrose-yellow, deeper on flanks; faint yellow ring around eye; wings and tail clove-brown, narrowly edged outwardly with olive-green, becoming olive-gray at tips of primaries and secondaries, and strongly tinged brown on wing-coverts; bill pale bistre above, flesh-color below; iris deep hazel-brown; feet pinkish-buff (adapted from J. Dwight).

Measurements. — Length 4.50 to 5.10 in.; spread 8.00 to 9.00; folded wing 2.40 to 2.75; tail 1.90 to 2.25; bill .45 to .50; tarsus .66 to .70. Female averages smaller than male.

Molts. — Practically same as those of Red-eyed Vireo (see page 180).

Field Marks. — Size, smaller and less bulky than Red-eyed Vireo; similar in appearance, but head very indistinctly striped or not striped, and much more yellowish below; chin and belly whitish; somewhat resembles Tennessee Warbler, or female Black-throated Blue Warbler.

Voice. — A scolding note almost exactly like the aggressive, nasal *m ў á* of the Warbling Vireo (J. Dwight); song closely resembles that of Red-eyed Vireo, but a mere trifle higher in pitch, and often not repeated so many times to the minute; also other soft and low calls and a low song.

Breeding. — In second-growth woods about the edges of farm lands (Wm. Brewster); in sparsely wooded country, among scattering young bushes and poplars, and in alders. *Nest:* In tall shrub or tree from 9 to 30 feet up; a deep pensile cup hung in a fork between two twigs or a small branch and a twig; built of shreds of bark, weed-stems and shreds of *usnea*, decorated externally with thin strips of birch bark, seed-tufts of willows, lined with pine needles and fine grass. *Eggs:* 3 or 4; .79 to .81 by .53 to .54 in.; elongate ovate; pure white, "sparsely spotted with burnt umber, chocolate and dull black" (Wm. Brewster); figured by William Brewster in Auk, Vol. XX, 1903, Plate XI. *Dates:* June 14, Lake Umbagog, Maine; June 9, southern Manitoba. *Incubation:* By both sexes. One brood yearly.

Range. — Most of southern Canada, eastern United States (west to the Great Plains), Yucatan and Central America. Breeds in Canadian Zone from central Alberta, southern Manitoba, northern Ontario, southern Quebec and New Brunswick south to northern North Dakota, northern Minnesota and northern New Hampshire; migrates over United States east of Great Plains and probably across Gulf of Mexico (no West Indian records); winters from northeastern Yucatan and Guatemala to Panama.

Distribution in New England. — *Maine:* Rare migrant; uncommon and probably local summer resident in northern parts. *New Hampshire:* Rare migrant; rare summer resident north of White Mountains. *Vermont:* Rare migrant; very rare summer resident. *Massachusetts, Rhode Island and Connecticut:* Rare migrant.

Season in Massachusetts. — May 10 to 30; September 7 to 27.

Haunts and Habits. Probably the trim little Philadelphia Vireo is not so rare a bird in Massachusetts as it is believed to be. Its song is so like that of the Red-eyed Vireo that no one not familiar with the songs of both species would question it, and amid the leaves the bird easily escapes notice. Even if seen, its colors and movements are so

like those of the Warbling Vireo that it is likely to be mistaken for that bird. As Bradford Torrey says, "it looks like one vireo and sings like another." It may occur almost anywhere in migration. I have seen it in the spring of the year three feet from the ground in a bush beside a city street, and from thirty to forty feet above ground in the woods. But probably it is most often seen in shrubbery or among the lower branches of trees, where it is not difficult to observe it. When seen it may be mistaken for a warbler, but not for another of our native vireos if its colors and their arrangement are noted carefully at short range, in good light.

Mr. Ludlow Griscom says of it in his excellent handbook on the birds of New York: "This species is tame, inactive, and prefers low or medium levels, and a good study of it is not particularly hard to obtain. Such a study simply *must be* obtained, however; identifying this bird on brief glimpses will not do. If really well seen, the uniformly yellow underparts, the whitish line over the eye, and the absence of any dusky stripes on the side of the head are readily observable. The bill and actions betray a vireo, but in size and color-pattern the bird is much more likely to be mistaken for a Tennessee Warbler, of which it is an exact replica. Here the relatively stout bill versus the needle-shaped bill of the Tennessee Warbler is the best clue. The former has a body which may be described as stout and chubby, while the warbler is very slender. The female Black-throated Blue Warbler is another possible source of error. While not so close in shade of color, the pattern is again the same, and the shape and bill have a closer resemblance. I have known the Philadelphia Vireo for fifteen years not only as a transient but also on its breeding grounds and winter quarters, and would sum up my experience as follows: I have never seen a Red-eyed or Warbling Vireo that I thought was a Philadelphia; I have never seen a Philadelphia really well that I thought was anything else; I have frequently followed up birds as Philadelphia Vireos that proved to be Tennessee Warblers, female Black-throated Blue Warblers, or not satisfactorily determinable." [1]

The female Black-throated Blue Warbler is readily distinguished whenever the little white patch on the wing can be seen. The ordinary observer who goes a-birding chiefly at week ends and on holidays will not be likely to identify this bird satisfactorily in Massachusetts more than three or four times in a lifetime — at least that has been my experience. But in northern Maine or in extreme northern New Hampshire, where it breeds, it is not difficult to find. The best description of its haunts, habits and notes that has come under my notice was published by Dr. Jonathan Dwight, Jr., in 1897, in the Auk,[2] and its nesting habits were well described by William Brewster in 1903 in the same publication.[3]

This vireo, having habits similar to those of the preceding species, feeds largely on similar foods. The two largest items of its food consist of caterpillars and leaf-beetles, both of them destructive to trees.

Economic Status. See page 179.

[1] Griscom, Ludlow: Birds of the New York City Region, 1923, pp. 305, 306.

[2] Auk, Vol. XIV, 1897, pp. 259–272.

[3] Auk, Vol. XX, 1903, pp. 369–376.

Vireosylva gilva gilva (Vieillot). Warbling Vireo.

Plate 79.

Description. — Similar in form to Red-eyed Vireo, but somewhat smaller; spurious primary obvious (longer than primary-coverts); coloration paler; grayer above and head very obscurely striped. *Adult (sexes alike)*: Resembles Philadelphia Vireo, but bill longer; paler above and paler and less yellow below; top of head and back of neck smoke-gray; back, scapulars, and lesser wing-coverts similar but tinged olive-greenish; wings and tail chiefly brownish-gray with paler edgings; sides of head pale buffy-gray, paling to whitish below eye; a narrow indistinct dark stripe through eye and a wide whitish stripe above it; below white or whitish, passing into pale buffy or pale yellowish on sides and flanks; bill brown or dusky-bluish-gray above, lighter below; iris brown; legs and feet bluish-gray or grayish-blue. *Young in first winter plumage:* Practically as adults, but browner or more buffy above and sometimes more yellowish on sides and flanks; greater wing-coverts tipped with buffy or "pale buffy-olive"; bill and feet pinkish-buff, becoming dusky and slate-gray respectively when older (J. Dwight).

Measurements. — Length 5.00 to 6.00 in.; spread 8.45 to 9.25; folded wing 2.26 to 3.00; tail 1.85 to 2.25; bill .40 to .47; tarsus .65 to .75. Female smaller than male.

Molts. — Similar to those of Red-eyed Vireo (see page 180).

Field Marks. — Size, smaller than Red-eyed Vireo; adults paler and grayer above; head very indistinctly striped or stripes not obvious; closely resembles Philadelphia Vireo, but paler and grayer above and whitish below, and not so yellowish on sides and flanks. Throat grayish-white as in Red-eyed Vireo.

Voice. — Scolding note "an angry *'tshay 'tshay*, like the Catbird, and other vireos" (Nuttall); song an extended beautiful warble, resembling that of the Purple Finch, but more languid, not so full and loud, and, unlike that of other vireos, with a sort of undertone.

Breeding. — Chiefly in rich, well-watered country, in farming regions, towns, villages, and suburbs and parks of cities, rarely, if ever, in large wooded tracts. *Nest:* In deciduous tree, such as silver-leafed poplar, elm, maple, linden or white ash, usually from 20 to 70 feet above ground; * near extreme end of long slender branch. *Nest:* A beautiful little basket hung between twigs, like that of Red-eyed Vireo, and fabricated from similar material, such as shreds of bark, soft silken vegetal fibers, etc., held together by spiders' webs and lined with hair or fine grasses. *Eggs:* 3 to 5; .70 to .83 by .51 to .58 in.; usually ovate; white, usually spotted with small reddish-brown, umber or blackish spots, or all three, chiefly about large end, some unmarked; figured by E. A. Capen in "Oölogy of New England," Plate VII, Fig. 6. *Dates:* May 24, southern Connecticut; May 30 to June 11, Massachusetts; June 15 to 30, Maine. *Incubation:* Period about 12 days; by both sexes. One brood yearly.

Range. — Eastern North America north to southern Canada and west to the Great Plains. Breeds in Austral zones from southern Saskatchewan, southern Manitoba, southern Ontario, southern Quebec, New Brunswick and Prince Edward Island south to northern Texas, Arkansas, southern Louisiana, Tennessee and North Carolina and west to eastern Montana, North Dakota, South Dakota, central Nebraska and Oklahoma; winters in southern Florida, but mostly beyond the southern boundaries of the United States.

Distribution in New England. — *Maine:* Common to rare or local summer resident. *New Hampshire:* Rather uncommon or local summer resident north to White Mountain valleys. *Vermont:* Common summer resident, but local or chiefly in valleys. *Massachusetts:* Formerly common summer resident, now uncommon, rare or local in eastern part. *Rhode Island and Connecticut:* Common summer resident.

Season in Massachusetts. — April 28 to September 27 (October 7 to 11).

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* Dr. Coues, however, speaks of nests 100 feet from the ground, and Robert Ridgway tells of several in Utah, not over four feet up in young aspens.

HAUNTS AND HABITS. The Warbling Vireo is a tree-top bird. Most of its daylight hours are spent in the tops of tall elms or other trees that stand along the streets or roads or in city parks, and there from its retirement in the concealing verdure the male sends forth his tender, soft and liquid strains. He is a remarkably persistent singer. Ralph Hoffmann estimates that the bird sings more than four thousand songs a day during the breeding season.

Formerly this bird was common in the street elms of eastern Massachusetts; many years ago it was represented in numbers on Boston Common, but in recent years it has become rare or local in all that region. Perhaps in another decade or two its numbers may increase again.

Dr. Coues with lavish rhetoric characterizes the bird as follows: "Neither disposed to undue familiarity, nor given to over-confidence, these urbane birds move in a quiet circle of their own, in slight contact with less polished members of society, quite apart from the vulgarity of the street and market-place, and always with the easy self-possession that marks the well-bred. We seldom see them, indeed; they are oftener a voice than a visible presence — just a ripple of melody threading its way through the mazes of verdure, now almost absorbed in the sighing of foliage, now flowing released on its grateful mission. Theirs is a tender, gentle strain, with just a touch of sadness, borne on the same breath that wafts us the perfume of April's early blossoms; and these are all the sweeter for the instillation of such song. From the poplar that glances both silver and green as its tremulous verdure is stirred — from the grand old halls of the stately, splendid-flowered liriodendron — from the canopied shade-weaving elm, and the redolent depths of magnolia — issues all summer long the same exquisite refrain, while the singers glide through their hermitage unseen. Who would know these *spirituelle* musicians better must be quick to catch a glimpse of a very small sober-colored bird whose tints are those of its leafy home, and whose course in the heart of the trees is as devious as the play of the sunbeam itself.

"The Warbling Vireo is no less agile a bird than his cousin the Red-eye, and equally tireless in the pursuit of his insect prey; both these birds sing as they go, with an unconscious air, as if in a reverie; but the easy and wonderfully skilful modulation of the former's flowing song contrasts to great advantage with the Red-eye's abrupt and somewhat jerky notes. Both are among the most persistent of our musicians; in the Middle States, for example, their notes are heard from the latter part of April until far into September, and at all hours of the day." [1]

The male bird is a good provider, and a good husband and father. He relieves the female on the nest, feeds her while she is sitting, and like all our vireos sings while taking his turn on the nest, and he assumes his full share of caring for the young.

The feeding habits of the bird are such that it takes principally the insect enemies of shade trees and orchard trees. As it is rather a skilful flycatcher, it takes both crawling and flying insects, among them horse flies, crane-flies, mosquitoes, caterpillars, plant-

[1] Coues, Elliott: Birds of the Colorado Valley, Part First, 1878, pp. 503, 504.

lice — which constitute its largest food item — beetles, especially leaf-beetles, and the twelve-spotted cucumber beetle. It goes to the ground for grasshoppers and locusts, of which it eats many. Few useful insects are taken, and the fruit eaten seems to be chiefly wild, and worthless as human food.

Economic Status. The Warbling Vireo is regarded by ornithologists generally as a beneficial bird. Says Dr. Elliott Coues: "But much as we may admire Gilvus in the agreeable sentiment which his song inspires, we owe him a higher and more respectful consideration for the good services he renders us in a very practical way. Inhabiting by choice our parks, lawns and orchards, and even the shade-trees of our busiest streets, rather than the untried depths of the forest, these birds collectively render efficient service by ridding us of unnumbered insects, whose presence is a pest, as well as a continual annoyance to sensitive persons. They take a foremost place among the useful birds for whose good services in this regard we have reason to be grateful, being much more beneficial than the European Sparrows, which we have imported for the same purpose, and against whose insolent aggressions these tender birds should be protected." [1]

Lanivíreo flávifrons (Vieillot). Yellow-throated Vireo.

Plate 79.

Description. — Formed somewhat as foregoing vireos but more robust, top of head more rounded in profile, and no obvious spurious primary. *Adults (sexes alike or similar)*: Head (chiefly), back and sides of neck and back yellowish-olive; rump slaty-gray; wings and tail chiefly black or blackish; edges of flight-feathers (except tertials), of tail-feathers and greater wing-coverts pale gray, which becomes white on outer tail-feathers; ends of middle and greater wing-coverts broadly white, forming two white wing-bars; edges of tertials less broadly white or pale yellow; lores, eye-ring, chin, throat, breast and sides chiefly yellow; rest of under plumage to ends of under tail-coverts chiefly white, with some indistinct washing or streaking of olive on sides of breast, sides and flanks; bill mostly brown or dark lead-color, bluish at base below; iris brown; legs and feet leaden or grayish-blue; yellow of female usually slightly duller and paler than in male. *Young in first winter plumage:* Similar to adults, but lesser wing-coverts edged with dull olive-green. *Young in juvenal plumage:* Marked much as in adult but smoke-gray above and edges of wing-feathers and tail-feathers olive-gray; chin, throat and sides of head pale yellow, region about eye still paler; "bill and feet pinkish-buff, becoming dusky and slate-gray when older" (J. Dwight).

Measurements. — Length 5.00 to 6.00 in.; spread 9.50 to 10.00; folded wing 3.00 to 3.23; tail 1.93 to 2.30; bill .50 to .57; tarsus .68 to .78. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (late June to August) involving body plumage and wing-coverts; first breeding plumage by wear, and adult winter plumage by complete postnuptial molt (late July to September); adults have but this one postnuptial molt, and breeding plumage is acquired by wear.

Field Marks. — Size somewhat smaller than Red-eyed Vireo; yellowish-olive head and back, dark wings and tail, two conspicuous white wing-bars; yellow line over and around eye and bright yellow chin, throat and breast make the bird unmistakable; Yellow-breasted Chat resembles it somewhat, but has no white wing-bars; Pine Warbler has a yellow front and two white wing-bars, but has indistinct streaks

[1] Birds of the Colorado Valley, Part First, 1878, p. 504.

on sides of breast, and no bright yellow line over and around the eye, and both bird and bill are more slender.

Voice. — Scolding note, similar to that of Warbling Vireo, and as harsh as that of Baltimore Oriole; song, similar in tone to that of Red-eyed Vireo, but louder and with reed-like quality and sung in more leisurely manner, two or three rich connected notes, the last ending with rising inflection, then a brief pause and another phrase ending with downward inflection, as if asking a question and then answering it; "*ullia eclya*" (H. D. Thoreau); sometimes a much longer song is given, also "an intricate liquid trill" (F. M. Chapman).

Breeding. — In open woods or about the edges of wooded tracts, also in parks, in pastures having large shade trees, and along shaded village streets, in gardens and dooryards, and orchards. *Nest:* In deciduous tree, often in an oak, from 3 to 50 feet above ground, but usually rather low; composed of fine shreds of bark, grasses, pine needles, etc., the rim of the nest and sometimes nearly all of it covered with tree lichens and plant down, attached by caterpillars' silk and spiders' webs, and like the nests of other vireos suspended from forked limb or twigs. *Eggs:* Usually 3 or 4; .79 to .95 by .58 to .65 in.; usually ovate or rounded ovate; white, and marked, especially about larger end, with large, dark purplish-brown spots, some lighter marks, and sparsely with fine dots, when fresh suffused with a rosy tint; not certainly distinguishable by color from those of other vireos, but usually more heavily marked; figured by E. A. Capen in "Oölogy of New England," Plate VII, Figs. 7, 8. *Dates:* May 1, Virginia; May 24 to June 2, Connecticut; May 24 to June 17, Massachusetts. *Incubation:* Period probably 12 to 14 days; by both sexes. One brood yearly. (See Fig. 77.)

Range. — Southern parts of eastern Canada, eastern United States west to the Great Plains, Yucatan, Central America and northern South America. Breeds in Transition and Austral zones from southern Saskatchewan, southern Manitoba, southeastern Ontario, southern Quebec and Maine south to central and southeastern Texas, southern Louisiana, southern Alabama and central Florida; winters from Yucatan through Central America to Colombia, and (casually) in Bahamas, Cuba and Isle of Pines.

Distribution in New England. — *Maine:* Rare summer resident, chiefly in southwestern counties. *New Hampshire:* Uncommon summer resident south of White Mountains. *Vermont:* Not uncommon local summer resident in villages. *Massachusetts:* Formerly common summer resident, though rather local, recently becoming rare in eastern part. *Rhode Island:* Common summer resident. *Connecticut:* Common migrant and summer resident.

Season in Massachusetts. — April 28 to September 18 (October 6).

Haunts and Habits. The Yellow-throated Vireo is a summer bird. Most individuals of the species arrive in Massachusetts after the middle of May and leave for the south in late August or early September. Very early and very late birds are mere stragglers. They are here mainly while the woods are in full leaf, keep usually in the tops of the larger trees and might be overlooked but for their loud, rich, distinctive song, coming as it does, not only from the woods, but from shade trees, orchards and gardens near our dwellings; for although this vireo is normally a forest bird, it has learned to trust the New England folk, so that it seeks rather than shuns their neighborhood. If it fails to bring up a brood, however, it is likely to leave the neighborhood, and thus it sometimes disappears from a locality, changing its place of residence in a quest, perhaps, of safer quarters. It is a favorite, and in this region is so confiding that it often hangs its nest from a low limb of an apple tree near some farmhouse. The nest is one of the most beautiful pieces of bird architecture to be found in this region. Gracefully shaped and lightly covered with tree lichens, it vies with the nests of the Ruby-throated Hummingbird and the Wood

Pewee, though not so neatly lined as either of these. Nest building occupies the mated pair for about a week.

Like all our vireos the male is a good father, taking on his share of the home duties, and he often sings while on the nest. Like other vireos also, the setting bird will sometimes stay on the nest (especially when the eggs are about to hatch) until one can almost place a hand upon its back. I watched one (apparently the male) that would actually allow a person to place the tips of the fingers upon his back before he would leave the nest. When the camera was mounted a few feet away and two persons and two dogs were on the ground immediately beneath the nest, this bird remained calmly sitting there.

I once found a nest in some open woods hanging from a low limb of an oak, while almost directly overhead was a Crow's nest containing young. The Crows could readily observe the smaller bird's nesting and incubating activities, and the reputation of the Crow as an egg-eater is well earned, but the pretty eggs in their little basket were intact, although overhead the black nest-robbers were constantly coming and going while feeding their young.

When the single brood has been raised the parents take them to the berry pastures and they pass the molting season amid the fruiting thickets and are ready for their long southward journey by September, if not before.

This species eats house flies, mosquitoes, moths, caterpillars, both hairless and hairy, including some of the most destructive tree pests, weevils and other injurious beetles, such as borers, grasshoppers, tree-hoppers, cicadas and now and then a bee, or some hymenopterous parasite. The wild berries that it eats are unimportant.

Economic Status. The Yellow-throated Vireo is regarded generally as a useful bird, to be carefully protected.

Lanivireo solitárius solitarius (Wilson). **Blue-headed Vireo.**

Other name: SOLITARY VIREO.

Plate 79.

Description. — Form similar to that of Yellow-throated Vireo; spurious primary well developed, longer than exposed part of bill. *Adults (sexes alike or similar)*: Head and neck chiefly deep slate-gray (not blue) or slate-color, deepening into slate-blackish on fore part of lores; back, rump and upper tail-coverts olive-green (green of back often mixed with slate-gray); wings and tail slaty-black with olive-green feather-margins; outer web of outer tail-feathers white; greater and middle wing-coverts tipped with white, whitish or pale yellowish, and tertials margined and tipped same (wing-bars not as broad and conspicuous as in Yellow-throated Vireo); broad line extending from base of upper mandible over and nearly around eye, chin, throat, middle of breast and belly, and under tail-coverts, white; sides of breast, sides and flanks sulphur-yellow (ill-defined) and olive-greenish mixed or arranged in stripes; wing linings and axillars pale sulphur-yellow; inner webs of flight-feathers and tail-feathers edged white; bill blackish above, pale grayish-blue below, darkening toward tip; iris deep brown; legs and feet bluish-gray or grayish-blue; female usually (but not always) slightly duller in color. *Young in first winter plumage:* Similar to adults and often difficult to distinguish from them, some are duller in color and head more brownish. *Young in juvenal plumage:* Above dark ashy or drab, tinged more or less with green; top of head and ear region much as in adult; wings and tail dark brown, marked much as in adult; two

whitish wing-bars; below white or whitish, tinged on sides and flanks and sometimes on all lower fore parts with buffy or pale yellow.

Measurements. — Length 5.00 to 6.00 in.; spread 8.35 to 9.75; folded wing 2.75 to 3.30; tail 1.94 to 2.40; bill .46 to .53; tarsus .70 to .78. Female smaller than male.

Molts. — Same as those of Yellow-throated Vireo (see page 188).

Field Marks. — Size somewhat smaller than Red-eyed Vireo, but more robust; above rather dark olive-green but with a slaty-gray head; "spectacles" as in Yellow-throated Vireo but white instead of yellow; two whitish wing-bars; white below; the first vireo to appear in spring.

Voice. — Scolding note, a querulous cry, similar to that of Red-eyed Vireo, but distinct from it; song, a wild sweet carol of the woods, the finest vireo song of New England, showing resemblance to that of Red-eyed Vireo in form but louder, clearer, more musical, and more deliberate, with longer intervals between the phrases; "sometimes the singer has a fit of ecstasy in which he runs his phrases, ordinarily separated by considerable intervals, rapidly together, and follows them by sweet twittering" (R. Hoffmann); also a musical chatter.

Breeding. — Usually in or near coniferous or deciduous tree, commonly from 5 to 12 feet from ground; a handsome, pensile cup like that of other vireos, usually decorated externally with strips of birch bark, oak catkins, or with leaves, lichens and plant down, etc., often lined with fine needles, and usually composed of a great variety of materials. *Eggs:* Usually 3 or 4; .75 to .95 by .50 to .65 in.; ovate or rounded ovate; white, spotted much like those of other vireos, with small spots and dots of reddish-brown, umber or blackish, or all three; figured by E. A. Capen in "Oölogy of New England," Plate VII, Fig. 9. *Dates:* May 27 to June 3, Connecticut; May 15 to June 15, Rhode Island; May 13 to June 26, Massachusetts; May 29 to June 30, New Hampshire. *Incubation:* Period 10 to 11 days (F. L. Burns); by both sexes. One brood yearly.

Range. — Most of southern Canada, eastern United States west to the Great Plains and Middle America. Breeds in Canadian and Transition zones from southwestern Mackenzie, north-central Saskatchewan, central Manitoba, northern Ontario, southern Quebec and Cape Breton Island south to central Alberta, northern North Dakota, central Minnesota, southern Wisconsin, northern Michigan, southern Ontario, southern Pennsylvania (in mountains) and southern Connecticut; winters from southern Texas, central Alabama and central North Carolina to Florida and through eastern Mexico to Guatemala; accidental in Cuba.

Distribution in New England. — Common to uncommon migrant generally, and common (local) to uncommon summer resident, except in Rhode Island and Connecticut, where rare local summer resident and rather uncommon migrant.

Season in Massachusetts. — (April 11) April 14 to October 28.

Haunts and Habits. The description of the song of the Blue-headed Vireo given under "*Voice*" hardly does it justice. As I have written elsewhere: "He whose ears are attuned to the harmonies of nature may find the Blue-headed or Solitary Vireo on warm April days or in early May in the wooded regions of most of the northeastern states. It may be recognized by its bluish head, the white ring around the eye, and the pure white throat. It heralds its presence at this time by its wild sweet song, a charming cadence of the wooded wilderness. Its notes seem more spiritual and less commonplace than those of the familiar vireos of village and farmstead." [1]

Bradford Torrey says: "In form its music resembles the Red-eye's, the Philadelphia's, and the Yellow-throat's; but to me it is more varied and beautiful than any of these, though some listeners may prefer the Yellow-throat for the richness and fullness of its

[1] Nature Lovers Library, Birds of America, T. G. Pearson, Editor, Vol. III, 1917, p. 107.

'organ tone.' The Solitary's song is matchless for the tenderness of its cadence, while in peculiarly happy moments the bird indulges in a continuous warble that is really enchanting." [1]

On August 19, 1907, at Mr. William Brewster's camp, in Concord, Massachusetts, I watched a Blue-headed Vireo sing beautifully in a subdued tone — almost a "whisper song." The bird apparently was molting, but still it sang. The song resembled in some respects the subdued autumnal music of the Catbird. It was interspersed with a very soft chattering like that of the Ruby-crowned Kinglet. The bird meanwhile searched about in a leisurely manner, scanning the under sides of the leaves from which it took hairy caterpillars, eating a part of each and discarding the rest.

In southern New England this is a bird of the white pine woods. On lowland or highland, mountain, valley or plain, it seeks the shade of columnar, sighing pines. It rarely breeds except amid its favorite pines or near them, though its nest is sometimes hung on a birch or even on an apple tree near the woods. Although this vireo has the reputation of a recluse, and usually retires to the woods to breed, it is by no means solitary, as one of its common names implies, nor is it shy as a rule, though some individuals are more so than most. Usually the incubating or brooding bird may be closely approached, whether male or female, and some have even allowed a visitor to touch them. Bradford Torrey tells of one bird, presumably a female (though some males are more fearless than some females), that allowed him to approach and stand by her and even feed her with insects, and soon permitted a friend to do the same. Mr. Torrey believed that once he fed the male on the nest also.[2]

The male bird is an attentive husband and father. He assists in building the nest, though often he only brings the material and sometimes very little of that, but he assists in incubation, in brooding and in the care of the young, and guards the nest jealously; like other vireos he frequently sings while on the nest. Thus one or the other of the parents usually may be found on or near the nest. When incubating one remains on the nest until the other returns and does not leave it unless its mate is ready to step in. Both parents are devoted to their young. Nesting, as it often does, in pine groves where hawks breed and rear their young, its nest is sometimes near-by that of the Cooper's Hawk, the Goshawk, the Red-tailed Hawk, or even that of the Sharp-shinned Hawk, though nearer the ground than that of its rapacious neighbors. It may be that these predatory fowls do not trouble their immediate small neighbors. At any rate this peculiar juxtaposition is not uncommon.

The food of this bird consists largely of destructive bugs, beetles and caterpillars; saw-flies, ants, two-winged flies, dragon-flies, grasshoppers, crickets and spiders are taken in much smaller numbers.

Economic Status. The Blue-headed Vireo is a conservator of the forest, a caterpillar hunter of renown. Says Professor Beal: "The vireos are practically wholly bene-

[1] Chapman, Frank M.: Handbook of Birds of Eastern North America, 1914, p. 428.
[2] Torrey, Bradford: A Rambler's Lease, 1894, pp. 27–43.

ficial to the interests of man in the matter of their food, which consists almost entirely of insects which are for the most part injurious species." [1]

Vireo griseus griseus (Boddaert). White-eyed Vireo.

Plate 79.

Description. — Similar in form to the foregoing vireos, with spurious primary well developed but bill shorter and stouter; tail square-ended. *Adults (sexes alike)*: Above bright olive-green graying slightly on hind neck; streak from base of upper mandible extending backward over and nearly around eye, yellow (interrupted in front of eye by dusky mark on lores); sides of head elsewhere and sides of neck mostly grayish-olive; wings and tail dusky-grayish-brown with olive-green edgings; tips of middle and greater wing-coverts yellowish-white forming two light wing-bars, tertials edged and tipped same; below chiefly white, but sides, flanks and wing linings yellow; shorter under tail-coverts tinged yellow; bill black or bluish-black above, bluish-gray below; iris white; legs and feet grayish-blue. *Young in first winter plumage:* Practically indistinguishable from adults, except by *iris which is gray. Young in juvenal plumage:* Similar to adult, but duller olive-green; upper plumage tinged brownish; line over eye and ring around it whitish; markings on wings yellowish-white; below grayish-white; "bill pinkish-buff, becoming dusky; feet paler, becoming plumbeous-gray; iris mouse-gray, becoming white by the following spring" (J. Dwight).

Measurements. — Length 4.50 to 5.50 in.; spread 7.50 to 8.45; folded wing 2.30 to 2.55; tail 1.90 to 2.50; bill .47 to .51; tarsus .70 to .80. Female smaller than male.

Molts. — Similar to those of Yellow-throated Vireo (see page 188), except that the postjuvenal molt does not usually begin until after the first of August, the juvenal plumage being worn longer than in other vireos.

Field Marks. — Smallest of our common vireos; size near that of Chipping Sparrow; a well-rounded, portly little olive-green bird with yellow "spectacles"; two yellowish-white wing-bars, and white below with yellow sides and flanks; a bird of shrubbery and thickets.

Voice. — "A hoarse mewing" (T. M. Brewer); a sharp click; a single note like that of the Bob-white (C. W. Townsend); song loud, startlingly energetic and very variable; a common rendition is *chip-whee-oo;* boys in southern Illinois interpret a common song as *chick'ty-bēaver lim-ber stick*, with strong accent on first syllable of each word (Ridgway); *tshĭppewee-wā-say, tshĭppewee-wēe-was-say* (Nuttall); the bird is an imitator also, and a ventriloquist.

Breeding. — In lowland thickets, often on the borders of swamps or marshes. *Nest:* In bush or low tree, from 2 to 8 feet above ground, often not over 4 feet; cup-shaped and suspended from a forked twig, woven from miscellaneous material, such as bits of wood, strips of bark, grasses, mosses, lichens, plant fibers, etc. *Eggs:* Usually 4; .75 to .82 by .55 to .62 in.; short rounded ovate to long ovate; white, sparsely marked, chiefly around large end, with very small spots and minute dots of black, dark purple or brown and faint lilac; figured by E. A. Capen in "Oölogy of New England," Plate VII, Fig. 10. *Dates:* April 22, Georgia; April 11 to May 3, South Carolina; May 20 to June 15, Virginia; May 22 to June 18, Massachusetts. *Incubation:* Period 16 days (A. A. Saunders), 12 days (E. A. Samuels). One brood yearly in the north, two at least in the south.

Range. — Eastern United States, eastern Mexico and Central America. Breeds chiefly in Upper and Lower Austral zones from southeastern Nebraska, northern Iowa, southern Wisconsin, southern Michigan (casually), northern Ohio, central New York and Massachusetts south to south-central and southeastern Texas, southern Alabama and central Florida; winters from southern Texas, central Alabama and South Carolina through eastern Mexico to Yucatan, Guatemala and Honduras; casual in

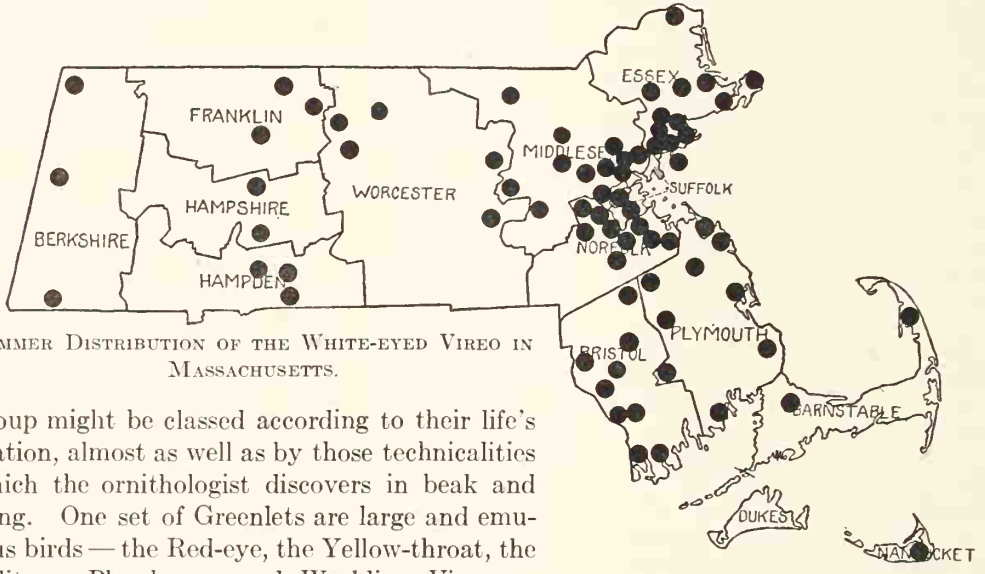
[1] Beal, F. E. L.: Birds as Conservators of the Forest, Report of the New York Forest, Fish and Game Commissioners for 1902–3, p. 263.

southern Ontario, Vermont, New Hampshire and New Brunswick; accidental in Cuba and the Bahama Islands.

Distribution in New England. — *Maine and New Hampshire:* Doubtfully recorded. *Vermont:* Very rare visitor. *Massachusetts:* Rare, local summer resident, chiefly near coast and in river valleys. *Rhode Island:* Uncommon local summer resident. *Connecticut:* Common summer resident in southern part and in river valleys; less common, local or rare elsewhere.

Season in Massachusetts. — April 20 to September 30.

Haunts and Habits. "Now leaving the ornamental park, the mantling woodland of deciduous trees, and the perpetual robe of green that the mountains wear, and losing as we go the band of Greenlet musicians that sing in these shades, let us push into more lowly places — for we have not done with the Vireos yet. Indeed, the species of this



Summer Distribution of the White-eyed Vireo in Massachusetts.

group might be classed according to their life's station, almost as well as by those technicalities which the ornithologist discovers in beak and wing. One set of Greenlets are large and emulous birds — the Red-eye, the Yellow-throat, the Solitary, Plumbeous, and Warbling Vireos — living in woodland high above the level of the ground; and these we have already seen in their native haunts. With the White-eyed Vireo we enter upon a group of smaller species, whose surroundings we shall find to be quite different; for these live in the thickets, down among the Catbirds, Thrashers, Sparrows, Chats and Wrens. This group of nearly-related, bush-loving species includes the Black-capped, the Least, and Bell's Vireos, besides the more familiar White-eye, whose turn comes first."[1] Thus that brilliant ornithologist, the late Dr. Elliott Coues, painted the haunts of the subject of this sketch, a true picture of its resorts.

In southern New England it is found chiefly in the coastal regions and in the lowlands of the river valleys, about swamps and ponds, and nearly always among the umbrageous

[1] Birds of the Colorado Valley, Part First, 1878, pp. 521, 522.

foliage of bosky thickets. In the South it may be found also in the highlands, wherever its favorite thickets abound. Not many of this species reach New England until about the second or third week in May, and most of them move southward in late August and early September. Though while with us this bird keeps largely hidden in thickets, it is not exceedingly shy. It is noted for its irascible temper whenever an intruder nears its nest, and in its excitement frequently approaches the invader, scolding him soundly meanwhile and jetting its tail. It is an inquisitive bird and shows its inordinate curiosity by stealing very near a person seated in its resorts and peering at him, much in the manner of the Catbird, when hardly more than an arm's-length away.

The most remarkable and noticeable characteristic of this bird is its song, which is loud for the size of the singer, very emphatic, so ventriloquial as to deceive the listener as to its locality, and not infrequently interrupted by, or interlarded with, fairly good fragmentary imitations of songs or notes of the Song Sparrow, Robin, Flicker, Catbird, House Wren, Goldfinch, Whip-poor-will, Yellow-breasted Chat, House Sparrow, Towhee, Carolina Wren, Warbling Vireo, Summer Tanager, Wood Thrush and others, and although its imitations are not as accurate as those of the Mockingbird, or even as those of the Starling, they are easily recognizable.

Bradford Torrey says that he saw a male of this species passing before a female, "puffing out his feathers, spreading his tail and crying hysterically *Yip, yip, yaah* — the last note a downright whine or snarl worthy of the Catbird." Apparently this was a courtship display.

Often the nest is located near a spring, for the bird is fond of water, or in a thicket or brier-patch at the edge of the woods. The parent birds are very devoted to their young and may even imperil their own lives in defence of their treasures. But they are frequently the victims of the Cowbird and are excellent foster parents for her young.

The chief food of the White-eyed Vireo consists of insects, such as small caterpillars, flies, ants and other forms which it finds in the thickets. It also feeds to some extent on wild berries.

Economic Status. The White-eyed Vireo is universally regarded as a useful bird, and it is not known to injure or destroy any product of man's labor.

Vireo bélli belli Audubon. **Bell's Vireo.**

Description. — *Adults* (*sexes alike*): Resemble White-eyed Vireo but differ from it as follows — streak above and around eye not white but yellowish, and usually interrupted both before and behind eye; rump and upper tail-coverts lighter in color, and lower plumage entirely yellow or yellowish, deepest on breast, sides and flanks; bill dark brown above, paler below; *iris brown;* legs and feet grayish-blue. *Young in first winter plumage:* Apparently closely resemble adult. *Young in juvenal plumage:* Similar to adult in markings, but more drab on hind neck, back and scapulars; *wing-bars more distinct;* body chiefly white below; sides, flanks, under tail-coverts and margins of tertials tinged yellow.

Measurements. — Length 4.75 to 5.00 in.; spread 7.00 to 8.00; folded wing 2.00 to 2.25; tail 1.58 to 1.90; bill .38 to .45; tarsus .68 to .79. Female smaller than male.

Molts. — Similar to those of Yellow-throated Vireo, but southern birds molt very early (see page 188).

Field Marks. — Size smaller than Chipping Sparrow; similar to White-eyed Vireo and difficult to distinguish from it in the field, but *line above eye yellowish* and broken or imperfect, and *iris not white but dark;* shows *one or two pale wing-bars;* is more yellow below.

Voice. — Call and alarm notes not quite so harsh as those of White-eyed Vireo; song, an "indescribable sputtering that does not rank it high in the musical scale" (N. S. Goss).

Breeding. — In prairie regions, in dense patches of briars, or along hedge fences. *Nest:* Like that of other vireos, suspended in same way, composed of many kinds of pliable materials and lined with soft substances, such as down or hair; usually low in a briar patch. *Eggs:* 3 or 4; .73 to .76 by .52 to .57 in.; white and slightly marked, as in other vireos, usually with brown or reddish spots. *Dates:* April 24, Corpus Christi, Texas; May 25, Illinois.

Range. — Central United States to Guatemala. Breeds in Austral zones from northeastern Colorado, southern South Dakota, northern Illinois and southern Wisconsin south to central-southern Texas and southern Tamaulipas; winters in southern Mexico from Guerrero to Guatemala; migrates through central Mexico west to Sinaloa; accidental in New Hampshire.

Distribution in New England. — Accidental visitor. Record: *New Hampshire:* Durham, November 19, 1897, bird taken by Ned Dearborn.[1]

Haunts and Habits. Bell's Vireo has been taken but once in New England, and its occurrence here is a mere accident, as its home is in the prairie regions of the West. Its habits are similar to those of the White-eyed Vireo, although it is even more addicted to thickets and patches of briars. Its song is similarly emphatic, but more "sputtering" and wren-like. The specimen taken at Durham, New Hampshire, appeared on a cold and cloudy day in November and seemed to be chilled, as it fluttered from twig to twig in the low growth by the roadside. The description indicates that it was a young bird, but I have not seen it. It was identified by Mr. Dearborn, who took it. The food of this bird is believed to be similar to that of the White-eyed Vireo.

Economic Status. See page 179.

Family **COMPSOTHLYPIDÆ.** Wood Warblers.

Number of species in North America 55; in Massachusetts 38.

The American Wood Warblers are now known as *Compsothlypidæ* (otherwise *Sylvicolidæ*), to distinguish them from the Old World warblers, the so-called *Sylviidæ*. The members of the group are small birds with nine primaries and ten tail-feathers, but as Dr. Coues says, it is impossible to define the family because it is an artificial group, corresponding with no natural division of birds, and consequently having no natural boundaries; nevertheless it is not difficult to recognize the North American members of the group, as, with few exceptions, they are clad in bright and varied colors, their specific characters in spring at least are well marked and their songs are distinctive, although they do not "warble."

The full juvenal plumage of most of the wood warblers is worn but a short time, often but a few days after the fledglings leave the nest, when they begin the molt into winter plumage. When this molt is practically completed in August both young and old begin

[1] Brewster, William: Auk, Vol. XVIII, 1901, p. 274.

PLATE 80

PLATE 80

BLACK AND WHITE WARBLER
Page 197

FEMALE

MALE

NORTHERN PARULA WARBLER
Page 225

ADULT MALE

ADULT FEMALE

WORM-EATING WARBLER
Page 203

ADULT MALE

PROTHONOTARY WARBLER
Page 200

ADULT MALE

the fall migration. In their southward flight most of them apparently pass to the westward of the southeastern states where they are rarely seen.

This is the second largest family of birds in North America; only the Finch and Sparrow Family (*Fringillidæ*) exceeds it in numbers. The bill is nearly straight and slender (its ridge usually somewhat curved). It is not hooked, toothed or deeply notched, but often nicked near the end, and never greatly widened at base. Usually the legs and feet are rather slender and modified according to the general mode of life. Most warblers are arboreal, getting their food largely from the foliage and leaves of trees, while some frequent shrubbery and others are largely terrestrial and obtain their food from the ground or near it. Some have the bill somewhat broadened at base and these catch many insects in flight.

The food of our warblers consists chiefly of insects, though some also eat fruit or drink fruit juices and some take a few seeds. In Dr. Frank M. Chapman's "Warblers of North America" there are nearly ten pages of material, from my pen, on "The Food of Warblers," which may be of some service to those specially interested.[1]

Economic Status. The following fine tribute to our warblers is from the facile pen of Dr. Elliott Coues: "With tireless industry do the Warblers befriend the human race; their unconscious zeal plays due part in the nice adjustment of Nature's forces, helping to bring about the balance of vegetable and insect life, without which agriculture would be vain. They visit the orchard when the apple and pear, the peach, plum, and cherry, are in bloom, seeming to revel carelessly amid the sweet-scented and delicately-tinted blossoms, but never faltering in their good work. They peer into the crevices of the bark, scrutinize each leaf, and explore the very heart of the buds, to detect, drag forth, and destroy those tiny creatures, singly insignificant, collectively a scourge, which prey upon the hopes of the fruit-grower, and which, if undisturbed, would bring his care to nought. Some Warblers flit incessantly in the terminal foliage of the tallest trees; others hug close to the scored trunks and gnarled boughs of the forest kings; some peep from the thicket, the coppice, the impenetrable mantle of shrubbery that decks tiny water-courses, playing at hide-and-seek with all comers; others more humble still descend to the ground, where they glide with pretty mincing steps and affected turning of the head this way and that, their delicate flesh-tinted feet just stirring the layer of withered leaves with which a past season carpeted the ground. We may seek Warblers everywhere in their season; we shall find them a continual surprise; all mood and circumstance is theirs."[2]

Mniotilta vária (Linnæus). Black and White Warbler.

Other names: BLACK AND WHITE CREEPING WARBLER; BLACK AND WHITE CREEPER.

Plate 80.

Description. — Ridge of bill somewhat convex; weak minute bristles about mouth; wing rather long and pointed; tail rather short; basal joint of middle toe attached to same joint of outer toe for most

[1] Chapman, Frank M.: The Warblers of North America, 1907, pp. 23–32.

[2] Birds of the Colorado Valley, Part First, 1878, pp. 201, 202.

of its length; plumage variable. *Adult male in breeding plumage:* Above, striped black and white; wings and tail black or blackish; edges of flight-feathers and tail-feathers gray, except those of tertials which are broadly white; two white wing-bars and large white spot on inner webs of two outer tail-feathers on each side, and usually more or less white on 3rd feather; large black patch on side of head, below and behind eye; below, white (throat more or less black, and sometimes chin) streaked with black on upper breast, sides and flanks; wing linings mostly white with some black feather-tips at outer edge; "bill blackish, white along edges, pale blue at base below; iris black; feet brownish-yellow, tarsi darker" (Allan Brooks); male taken in Colombia March 10, "bill black above, white below; iris dark brown; legs and feet dark brown" (M. G. Palmer); male taken at Fort Simpson, Mackenzie, May 28, "bill black; iris hazel; legs brownish-gray" (B. R. Ross). *Adult male in winter plumage:* Similar to same in spring, but less black and more white on breast and throat. *Young male in first winter plumage:* Similar to adult male in fall and winter, but cheeks more or less white and usually a black streak before eye; below white, streaked black, chiefly on side and flanks, and wings and tail duller or browner. *Adult female in breeding plumage:* Similar to male in breeding plumage, but much duller in color, the white tinged buffy-brownish except on lores and behind eye where tinged grayish; narrow black streak behind eye; elsewhere below white, streaked only on sides and flanks, and much less distinctly than in adult male; similar to young male, but more brownish above and streaks below less distinct. *Female in winter plumage (adult and young alike):* Similar to adult female in spring, but more strongly marked with brownish; one taken in Colombia in winter had bill black above, gray below, iris black, feet dark gray; another, bill black above, white below, iris dark brown, feet dark brown (M. G. Palmer); one female taken in Colombia in December, had bill, eyes and feet same as March male above; another taken in March had bill black, iris black, legs and feet dark gray (M. G. Palmer). *Young in juvenal plumage:* Above, wood-brown, streaked with dull olive-brown (J. Dwight), but recognizable by markings of head, wings and tail, which are, in general, similar to those of adults, though duller in color; whitish below, tinged brownish on throat and breast, and obscurely streaked there and on sides with dusky.

Measurements. — Length 4.55 to 5.50 in.; spread 8.20 to 9.00; folded wing 2.35 to 3.00; tail 1.85 to 2.25; bill .50 to .58; tarsus .60 to .70. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (July, August) involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt, involving a large part of body plumage (but often very limited or suppressed in the female); adult winter plumage by complete molt (July, August); adults have complete postnuptial molt (July, August) and incomplete prenuptial molt as in young.

Field Marks. — Size, near Chipping Sparrow, somewhat smaller and more slim. *Male:* A striped black and white bird; slender bill, slightly curved; two white wing-bars on a black ground; spends much time hopping along on the trunks and branches of trees, and with each hop turning its head in a different direction; nothing at all like it, except male Black-poll Warbler, which has solid black cap, while Black and White Warbler has a wide white central stripe through black cap. *Female and young:* Similarly marked, but much duller than male; throat white, and less distinctly marked on white lower plumage.

Voice. — Call, a weak *tsip;* a harsher *tsip;* a loud *chick;* sometimes a *chink;* an alarm-note *chick-a-chick, chick-chick;* sometimes more like *chee-chee-chee* (H. D. Minot); song, a wiry *wee-scé, wee-seé, wee-seé, wee-scé* or *whé-chee, whé-chee, whé-chee* (E. A. Samuels); *ssee-wwee-ssee-wwee-ssee-wwee-see-wee* (G. H. Thayer); to this a few more musical notes sometimes are added; *vee vee, vee vee, vitchet vitchet vitchet vitchet,* and *te che, te che, te che, te che, te che, te che, te che, te che* (H. D. Thoreau).

Breeding. — Usually in deciduous or mixed woodlands, hillsides preferred. *Nest:* On ground in a depression scooped out by the bird at foot of stump or birch, upturned roots of fallen tree, or under projecting roots or fallen log, and well hidden, sometimes in low hole in stump or tree; fashioned of grasses, rootlets, leaves, mosses, etc.; lined with finer grasses, fern-down, hair or similar soft material; sometimes deeply sunken and partially roofed over. *Eggs:* 4 or 5; .65 to .75 by .48 to .59 in.; rounded oval to short ovate, less pointed than many warblers' eggs; creamy-white, profusely spotted and speckled over

entire surface with chestnut, reddish-brown, dark brown and lavender, spots usually clustering more or less about large end; figured by E. A. Capen in "Oölogy of New England," Plate III, Figs. 2, 3, and by Frank M. Chapman in "The Warblers of North America," Figs. 3–5. *Dates:* May 20 to June 4, Connecticut; May 18 to May 30, Massachusetts; May 17 to June 22, southern Maine. *Incubation:* Period 13 days (P. L. Hatch); by female. One brood yearly.

Range. — Eastern and central (casually western) North America, Central America and northern South America. Breeds in Canadian and Austral zones from central-western Mackenzie, northern Alberta, central Manitoba, northern Ontario, southern Quebec and Newfoundland south to central Texas, southern Louisiana, central Alabama, northern Georgia, northern South Carolina and southern North Carolina and west to western Alberta, eastern Montana, central South Dakota, central Nebraska, eastern Kansas and eastern Oklahoma; winters from southern Lower California (casually), Sinaloa, central-southern Texas, northern Florida and the Bahamas, south through the West Indies (east to Guadaloupe Island) and Mexico to Ecuador, Colombia and Venezuela; casual in Wyoming, Colorado, California and the Bermuda Islands.

Distribution in New England. — Common migrant and less common summer resident, becoming local in Maine.

Season in Massachusetts. — (April 11, 17) April 28 to October 29 (December 5).

Haunts and Habits. In the last days of April or in early May, when the buds on deciduous trees are swelling and when tiny, light green leaflets appear on the shrubbery, in sheltered sunny spots we may find a little black and white striped bird hopping along the lower limbs in the woodlands, turning this way and that, searching over the branches from one side to the other, often head downward, closely scanning the bark, silently gleaning the insect enemies of the trees. This is the Black and White Warbler. A day or two later we may hear his attenuated wiry song as he industriously searches over his favorite trees for the wherewithal to nourish him and sustain his manifold activities of climbing, flight and song. When with the opening of the leaves his favorite insect food becomes more plentiful, his spirits rise, and occasionally he adds a few more musical notes to his song. When the females arrive there is much agitation, and often a long-continued intermittent pursuit, with much song and fluttering of black and white plumage, and much interference from rival males before the happy pair are united and begin nesting. The female is the chief builder, and attends to the duties of incubation, but the male assists in caring for the young. When the female, who is a very devoted parent, is surprised on her carefully hidden nest by an intruder, she is likely to attempt to lead him away by pretending to be crippled and by fluttering painfully in his path, using every artifice to induce him to follow her.

When the young in the nest are more than half-grown it is well not to handle or disturb them, as they are then likely to spring out and run away, beating their little wings in a fruitless attempt at flight. The general color of the nestlings is almost exactly the same as that of the forest floor, where they readily hide, and once out of their snug home, they are not likely to return to it.

When the frosts come in September the Black and White Warblers that breed in southern New England depart for the south, but others continue to come from the north until October nights grow cold.

The food of this bird consists mostly of the enemies of trees, such as plant-lice, scale-lice, caterpillars, both hairy and hairless, among them such destructive enemies of orchard, shade and forest trees as the canker-worm and the gipsy, brown-tail, tent and forest tent caterpillars. Wood-boring and bark-boring insects, click beetles, curculios and many other winged insects are taken. Sometimes when the quick-moving insects escape its sharp bill, it pursues them on the wing but most of its attention is devoted to those on the trees.

Economic Status. What little is known about the food of the species is all in its favor. Its feeding habits indicate its utility in forest and orchard.

Protonotária cítrea (Boddaert). **Prothonotary Warbler.**

Plate 80.

Description. — Bill rather long, nearly straight (slightly convex) and sharp-pointed; wings medium and pointed; tail medium and rounded; toes long, especially the hind toe. *Adult male in breeding plumage: Head and neck all round and all lower plumage bright yellow* (except white under tail-coverts), head, and sometimes breast, tinged cadmium-orange; back and scapulars yellowish-olive-green, which sometimes extends over hind neck and back parts of head; rump, upper tail-coverts, wing-coverts and tertials gray or bluish-gray, except first primary-covert which is margined white; primaries, secondaries and tail black or blackish, edged gray or bluish-gray, so that when closed, wings and tail show only gray; no wing-bars; most of inner webs of all but two middle tail-feathers white; bend of wing and wing linings chiefly yellow or yellowish, with some dusky marks near outer edge; bill dusky or black; iris black; legs and feet dark blue. *Adult male in winter plumage:* Similar to adult male in spring, but back of head often washed dusky, and bill brownish above, paler below. *Young male in first winter plumage:* Similar to adult male in fall and winter but white in tail restricted, and mottled more or less with blackish; first primary-covert gray; black of wings and tail and gray edgings somewhat duller. *Adult female in breeding plumage:* Similar to adult male but duller in color, the yellow duller or paler, tinged olive and less extensive about head, its place largely taken by an extension of olive-green of back. *Adult and young females in winter plumage:* Similar to adult female in spring and practically indistinguishable; young birds may average a little duller in color. *Young in juvenal plumage:* Brown or brownish-olive-green above, and wood-brown to brownish-white below; wing-coverts greenish or yellowish-brown, wings and tail not so bright as in adults; "bill and feet pinkish-buff becoming dark" (J. Dwight).

Measurements. — Length 5.30 to 5.50 in.; spread 8.50 to 9.08; folded wing 2.75 to 3.00; tail 1.87 to 2.25; bill .50 to .56; tarsus .60 to .75. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (June, July) involving body plumage and wing-coverts; first breeding plumage by wear, and adult winter plumage by complete postnuptial molt; adults have this molt only (July and August), breeding plumage resulting from wear.

Field Marks. — A large warbler, restless but usually rather deliberate in movement, size somewhat smaller than Song Sparrow, larger than Chipping Sparrow; bill long for a warbler. *Male: Head* and *lower plumage* (except under tail-coverts) yellow, often with a tinge of orange; back yellowish-olive-green; rump, upper tail-coverts, wings and tail when closed, steel-gray; tail when spread shows much black and white. *Female:* Similar but colors duller. No wing-bars in either sex.

Voice. — Call note a soft *tchip* or *tsip;* alarm note, sharp and nearly like that of the Louisiana Water-Thrush; song, a simple *peet, tweet, tweet, tweet,* on same key throughout, like the note of Solitary Sandpiper with a syllable or two added; also a low, feeble but far sweeter flight-song (Wm. Brewster).

BREEDING. — Usually (not always) in wooded, swampy lands. *Nest:* In hole in tree, sometimes in one excavated by the birds, often over water, from 1 to 15 (rarely 25) feet up; sometimes in cavities or nooks about bridges or buildings, or even in bird houses or nesting boxes; when in large cavity may be quite bulky; composed of moss, grass, leaves, lichens, bark-strips, rootlets, bits of decaying wood and other vegetal substances and rarely lined chiefly with hair or feathers. *Eggs:* 3 to 7, usually 5 or 6; .70 to .76 by .53 to .61 in.; short or rounded oval; rich creamy-white, profusely spotted and blotched with chestnut-red and lavender and purplish shades, some have comparatively few spots of purplish-brown, very variable in marking and coloration; figured by Frank M. Chapman in "The Warblers of North America," Figs. 6, 7. *Dates:* May 2 to June 23, South Carolina; May 10 to 25, Virginia; May 21 to July 7, southern Illinois. *Incubation:* Period 10 to 14 days; by female. One or two broods yearly.

RANGE. — Eastern United States (west to the Great Plains), southeastern Canada, southeastern Mexico, Central America and northern South America. Breeds in Lower Austral Zone, and in some river bottoms of Upper Austral Zone, from central-eastern Nebraska, south-central Minnesota, central Wisconsin, southern Michigan, central Ohio, southern Maryland and central Delaware south to southeastern Texas, southern Alabama and central Florida and west to central Iowa, eastern Kansas and central Oklahoma; migrates apparently across the Gulf of Mexico; winters from Campeche (rarely), Yucatan (rarely) and Nicaragua to Colombia, Venezuela and Ecuador; casual north to southern Ontario, New York, New Hampshire and Maine; accidental in New Brunswick, Colorado, Arizona, Cuba, Bahama Islands, Bermuda Islands and Island of Trinidad.

DISTRIBUTION IN NEW ENGLAND. — Very rare or accidental straggler; not known to breed. Records: *Maine:* Calais, October 30, 1862, male taken by George A. Boardman;[1] Matinicus Island, August, 1868, one taken by Dr. Roland Thaxter.[2] *New Hampshire:* Concord, May 22, 1929, bird seen by J. J. Welsh and F. B. White;[3] *Vermont:* Lunenburg, Karl Pember's manuscript list gives two taken by W. E. Balch, and the skins deposited in the Fairbanks Museum of Natural Sciences, St. Johnsbury; St. Johnsbury, May 14 to July 22, 1916, two birds seen, probably a pair, may have nested but no definite evidence, observations of Miss Inez Addie Howe.[4] *Massachusetts:* Ten early records given in Howe and Allen's "Birds of Massachusetts," 1901, p. 118; additional records — South Braintree, May 9, 1900, male taken by George Nelson, specimen now in collection of Boston Society of Natural History; Boston (Public Garden), May 19, 20, 1900, bird seen by Dr. Manning K. Rand and others;[5] May 20 to 22, 1927, another seen by Morris Brounstein and others;[6] Milton, "middle of May, 1902 or 1903," bird seen;[7] Auburndale, May, 1907, bird taken by F. H. Kennard, specimen in the collection of the Boston Society of Natural History; Concord, May 1, 1908, bird seen by Mrs. L. E. Bridge;[8] Marlboro, May 13 and 15, 1908, bird seen by Mrs. F. A. Wheeler and Mrs. S. P. Willard;[9] May 13, 14, 1915, one seen by various people;[10] Wellesley, June 2, 1909, male seen by Miss Angie Clara Chapin;[11] Amherst, May 3, 1912, bird seen;[12] Arlington, May 21, 22, 1912, one seen by Miss Mary E. Hadley;[13] Ipswich, September 13, 1913, male seen by Dr. Winsor M. Tyler;[14] Hopkinton, May 24, 1914, bird seen by Isabelle Alexander

[1] Verrill, A. E.: Proceedings, Boston Society of Natural History, Vol. IX, 1863, p. 234.
[2] Brewster, William: Auk, Vol. XXVI, 1909, p. 309.
[3] White, Francis B.: Auk, Vol. XLVI, 1929, p. 394.
[4] Vermont Botanical and Bird Clubs, Joint Bulletin No. 3, April, 1917, p. 29.
[5] Wright, Horace W.: Birds of the Boston Public Garden, 1909, p. 145.
[6] Bulletin, Massachusetts Audubon Society, Vol. XI, June, 1927, p. 6.
[7] Forbes, Ralph E.: *in litt.*
[8] Auk, Vol. XXV, 1908, pp. 319, 320.
[9] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. I, 1908, p. 58.
[10] Freeborn, Mrs. F. K.: Bird-Lore, Vol. XVII, 1915, pp. 385, 386; Cheney, Rev. Robert F.: *in litt.*
[11] Bird-Lore, Vol. XII, 1910, p. 76.
[12] Smith, Miss Ethel M.: *in litt.*
[13] Tyler, Dr. Winsor M.: Auk, Vol. XXXI, 1914, p. 103.
[14] *Ibid.*

Robry;[1] Beverly, May 26, 1914, female picked up dead after it had struck a window pane, received by C. J. Maynard from Miss Viola E. Crittenden;[2] Sharon, May 28, 1918, bird seen by Mrs. Harriet A. Goode;[3] Palmer, May 16, 17, 1920, bird seen;[4] Waltham, May 5, 1925, bird seen;[5] East Lexington, May 1, 1926, bird seen.[6] *Rhode Island:* South Kingston, April 20 or 21, 1884, male taken by Herbert Holland and recorded by R. G. Hazard, 2nd;[7] Lonsdale, April 29, 1892, male taken, and April 19, 1893, another male taken, both by William Deardon;[8] Point Judith, April 3, 1920, bird found dead, now in the collection of the Kingston Agricultural College.[9] *Connecticut:* Glastonbury, May 14, 1910, bird seen by L. W. Ripley;[10] New Haven, November 27, 1911, immature female found dead by Miss Mary Jennings.[11]

Season in Massachusetts. — May 1 to September 14.

Haunts and Habits. The Prothonotary Warbler is normally a bird of swamps or overflowed lands, and, in the north, willows growing in or near water seem to attract it. In full sunlight it is a remarkably beautiful bird. Its brilliant breast seems to glow like a torch when seen against the dark background of the swamp. The bird is only a straggler to New England, and though pairs have been seen within our territory, they have never been known to breed here.

In courtship the male makes a wonderful display, swelling and partially erecting his plumage and spreading his wings and tail. At this season he is very irascible and there are frequent combats between two males, during which both of the combatants sometimes fall into the water.

This is the only warbler in North America that is known to nest habitually in holes in trees. The male apparently renders some assistance to the female by bringing nesting material, and he joins her in feeding the young, but the female usually does most of the nest building. Dr. Arthur A. Allen, however, observed a male which built a nest alone, and waited apparently nine days for a female which never appeared. He finally deserted the nest.[12]

Mr. P. A. Taverner tells of a pair that chose a very unusual situation for their nest. They utilized a letter box on the front of a piazza of a house situated in a busy city street and close to the traffic. First the female (apparently), came into the house at the back door and was let out at the front. Three days later a nest partly built was found in the letter box and thrown out, but the nest building continued; again the nest was thrown out and later replaced by the residents, and the birds were allowed to raise young in the box.[13]

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[1] Bird-Lore, Vol. XVI, 1914, p. 447.
[2] Townsend, C. W.: Supplement, Birds of Essex County, Massachusetts, 1920, p. 159.
[3] Bulletin, Massachusetts Audubon Society, Vol. II, 1918, p. 7.
[4] Hitchcock, Mrs. W. C.: *in litt.*
[5] Little, Leslie T.: *in litt.*
[6] Taylor, Horace: *in litt.*
[7] Auk, Vol. I, 1884, p. 290.
[8] Howe, R. H. Jr., and Sturtevant, Edward: Birds of Rhode Island, 1899, p. 78.
[9] Hathaway, Harry S.: *in litt.*
[10] Sage, Bishop and Bliss: Birds of Connecticut, 1913, p. 148.
[11] Smith, Wilbur F.: Bird-Lore, Vol. XIV, 1912, p. 109.
[12] Auk, Vol. XXVIII, 1911, p. 115.
[13] Auk, Vol. XXIII, 1906, p. 107.

When the young of the second brood have become strong on the wing, the birds of this species breeding in the middle and south Atlantic states start southward. Apparently, according to Dr. Frank M. Chapman, they fly then to northwest Florida and from there go straight out to sea, flying 700 miles across the Gulf of Mexico to southern Yucatan, instead of following down the peninsula of Florida and then passing over Cuba on their way, as a human flyer naturally would do, as a matter of precaution. Doubtless many lose their lives in the crossing.*

The food of this bird consists of caterpillars and other larvæ, ants, flies, bees, locusts and other insects, many of them aquatic, and spiders; Audubon says that he found small snails in the stomach of this species, but no exhaustive investigation of its food has been made.

Economic Status. See page 197.

Helmithéros vermívorus (Gmelin). Worm-eating Warbler.

Other name: FOREST CHIPPY.

Plate 80.

Description. — Bill large and long for a warbler, nearly as long as head, sharp-pointed, high and stout at base, with few bristles or none; wings rather long and somewhat pointed, much longer than short slightly rounded tail. *Adults (sexes alike or similar)*: Above, chiefly grayish-olive-green; head buffy, tinged with olive on crown, with four black stripes, one (broad) on each side of crown, from bill to nape, and one (narrow) on each side of head through eye (sometimes dusky-grayish before eye); below, pale buffy, deepest on upper breast, paler on abdomen, tinged grayish-olive on flanks; under tail-coverts similar, but usually grayer; wing linings pale yellowish; bill brown above, pale brown below; iris deep brown; legs and feet brown or pale brownish-flesh-color; very little seasonal change. *Young in first winter plumage:* Practically as adults and hardly distinguishable from them. *Young in juvenal plumage:* Variable, ranging from deep buff to brownish or cinnamon; wings and tail much as in adult, except tips of greater wing-coverts which are buffy; usually browner above than below; recognizable by head, striped as in adults but stripes duller or brownish; bill and feet "pinkish-buff."

Measurements. — Length 5.00 to 5.70 in.; spread 8.10 to 8.75; folded wing 2.55 to 2.94; tail 1.86 to 2.06; bill .55 to .64; tarsus .52 to .65. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (June, July) involving body plumage and wing-coverts; first breeding plumage by wear, and adult winter plumage by complete postnuptial molt (June, July); adults have only postnuptial molt, and acquire breeding plumage by wear.

Field Marks. — Size near that of Chipping Sparrow; an olive-greenish bird without wing-bars; head and lower plumage buffy, and *four black stripes on head*, one on either side of crown and one through each eye; no other markings; very nimble and often rather shy or secretive; *walks* much on ground bobbing its head meanwhile.

Voice. — Alarm note, "*chip-chip-chip*," given with such energy as to shake the bird's frame; call note, a sharp *dzt*, like that of Black and White Warbler; song, a "torrent" of *chips* not unlike those of Chipping Sparrow (W. L. Dawson); also a flight-song uttered near sunset and nearly as brilliant as that of the Oven-bird (John Burroughs); a song resembling that of the Goldfinch (F. L. Burns).

* For more extended accounts of the habits, nesting and life history of this bird, see William Brewster on "The Prothonotary Warbler," Bulletin, Nuttall Ornithological Club, Vol. III, 1878, pp. 153–162, and R. M. Barnes, "Nesting of the Prothonotary Warbler," Ornithologist and Oölogist, Vol. XIV, 1889, p. 37.

Breeding. — In dense undergrowth, in woodlands, wooded ravines, deep damp woods or on wooded hillsides, sometimes in more open places, little shaded. *Nest:* On ground, usually sunken in hillside or side of ravine or beside a log, without much concealment; commonly near a swamp or a stream; usually composed of leaves or leaves and moss, and "lined with the red flower stems of the hair moss (*Polytrichum*)" (T. H. Jackson), and sometimes in part with fine grass and horsehair. *Eggs:* 3 to 6, usually 4 or 5; .60 to .78 by .48 to .54 in.; short rounded oval to ovate; white, spotted more or less with markings of various sizes in chestnut, lavender and light and dark reddish, often grouped most thickly about large end, but very variable; resembling those of Carolina Wren; figured by E. A. Capen in "Oölogy of New England," Plate III, Fig. 6, and by F. M. Chapman in "The Warblers of North America," Figs. 9–11. *Dates:* May 12 to 20, Virginia; May 26 to June 15, Pennsylvania; May 25 to June 19, Connecticut. *Incubation:* Period 13 days (F. L. Burns); by female. One brood yearly.

Range. — Eastern United States, Mexico and Central America. Breeds mainly in Upper Austral Zone from southeastern Nebraska, southern Iowa, northern Illinois, northern Ohio, Pennsylvania, southern New York and southern Connecticut south to northern Arkansas, northern Alabama, northern South Carolina and central-eastern North Carolina; probably migrates chiefly across the Gulf of Mexico; winters from Tamaulipas through eastern Mexico and Central America, and from southeastern Georgia to the Bahama Islands, Cuba, Jamaica and Panama; accidental or casual in migration in southern Wisconsin, southern Michigan, southern Ontario, western New York, Vermont and Massachusetts.

Distribution in New England. — Accidental or casual straggler from the south in northern New England; no specimen actually taken and recorded in Maine or New Hampshire, and only one in Vermont; casual or occasional straggler in Massachusetts; not recorded in Rhode Island, and a rare summer resident generally in Connecticut, but locally not uncommon. Records: *Maine:* In Proceedings Essex Institute, Vol. 3, p. 156, Professor Verrill records the bird as "summer, southern Maine" (no date); Gorham, April 28, 1919, male seen.[1] *New Hampshire:* Manchester, bird recorded as seen October 1, 1900, by Mrs. A. A. MacLeod;[2] Sandwich, August 31, 1919, bird seen;[3] East Westmoreland, September 12, 1924, adult male seen.[4] *Vermont:* In Glover M. Allen's "List of the Aves" a record is mentioned at St. Albans in 1891, no further data and no reference; in Karl Pember's manuscript "Vermont Bird List," 1926, one is recorded as "taken in Lunenburg by Mr. Balch," another "Waterford, August 26, 1914," also "June 24, 1917, Miss Howe," no further data. Mr. Pember, Mr. Balch and Miss Howe are deceased, and thus the Vermont records are all rather unsatisfactory. These notes will hardly establish the species as a bird of Maine, New Hampshire or Vermont, as no specimen taken in any of these states can be located. *Massachusetts:* Three records are given in Howe and Allen's "Birds of Massachusetts," 1901, p. 111; additional records — Longmeadow, July 4, 1899, male taken by L. C. Holcomb, specimen now in collection of Boston Society of Natural History; Salem Willows, April 14 to 16, 1902, bird seen by H. C. Farwell, J. H. Sears and others, taken on the 16th, and now in collection of Peabody Museum at Salem;[5] Phillipston, May 15, 1906, May 18, 1908, and "three days in succession" in May, 1915, single birds were seen;[6] Amherst, May 31, 1909, bird seen;[7] Marlboro, May 25, 1917, one seen by Dr. and Mrs. S. P. Willard; Southboro, May 25, 1917, one seen by Rev. Robert F. Cheney and Mrs. Cheney[8] (probably different individuals were seen in these last two reports, as the observers were four miles apart, and observations were made the same morning); Waltham, May 26, 1917, bird seen by Mr. and Mrs. George H. Mellen;[9] Lynn, May 29, 1919, bird seen;[10] South Sudbury, May 18, 1920, bird seen;[11] West Manchester, June 3, 1920, bird seen.[12]

Season in Massachusetts. — (April 19) May 18 to September 19.

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[1] Lombard, Mrs. Herbert: *in litt.*
[2] Allen, Glover M.: A List of the Birds of New Hampshire, 1903, p. 156.
[3] Holman, R. H.: *in litt.*
[4] Shelley, Lewis O.: *in litt.*
[5] Townsend, C. W.: Birds of Essex County, Massachusetts, 1905, p. 287.
[6] Dunn, Mrs. Myra: *in litt.*
[7] Smith, Miss Ethel M.: *in litt.*
[8] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. IX, 1917, pp. 146, 147.
[9] *Ibid.*, p. 99.
[10] Tufts, Miss Mary I.: *in litt.*
[11] Smith, Miss Lottie M.: *in litt.*
[12] Boardman, Miss E. D.: *in litt.*

HAUNTS AND HABITS. The Worm-eating Warbler seems to belie its name. I find no records of any consumption of earthworms by this species, which although a typical ground warbler spends some of its time hunting among the branches of trees, where it finds span-worms. It also hunts on the ground in damp places frequented by army-worms. Nevertheless these are not worms but caterpillars. Probably, however, in its perambulations and peregrinations upon the surface of the earth the bird now and then does pick up a small earthworm, for earthworms form a staple food for many birds when the ground is moist.

This modest and rather shy and secretive bird may be quickly recognized, whenever plainly seen, by its well marked striped head and large bill. In the North it frequents wooded hillsides. "In such a country," says Mr. Ludlow Griscom (speaking of the New York City region), "a Chipping Sparrow song almost certainly can be traced to this species. A practiced ear can distinguish the two songs, however, the Sparrow having a 'rattle' in its effort, rather than the 'buzz' of the Warbler." [1]

Often the bird may be seen on the ground, walking about rather slowly, bobbing its head as it steps, and habitually carrying its tail quite high. When in the trees, which it sometimes ascends to a considerable height, it may be seen at times searching about the trunk and branches, much in the manner of the Black and White Warbler. It feeds largely in low, damp, bushy places where it can easily avoid observation, and as it is very inconspicuous it escapes the notice of the ordinary observer.

In addition to its caterpillar diet, little is known of its food habits. Mr. A. H. Howell says that stomachs from birds of this species taken in Alabama contained remains of caterpillars, beetles, bugs and hymenoptera. The bird also eats ants.[2]

ECONOMIC STATUS. See page 197.

Vermívora pínus (LINNÆUS). Blue-winged Warbler.

Other name: BLUE-WINGED YELLOW WARBLER.

Plate 81.

DESCRIPTION. — Bill hardly two-thirds as long as head, slender, nearly straight, acutely pointed and without bristles; wings pointed, longer than nearly even tail. *Adult male in breeding plumage:* Forehead, most of top of head, sides of head and all lower plumage (except whitish under tail-coverts) lemon-yellow; sides and flanks very faintly tinged with olive-green; stripe from bill through eye (narrowing behind eye) black; back parts of head and neck, *back, scapulars, rump and upper tail-coverts olive-green,* slightly more yellowish on rump and much more gray on upper tail-coverts; *wing-coverts and inner wing-feathers usually gray or bluish-gray, not blue,* with usually *two white or yellowish wing-bars* formed by light tips of greater and middle wing-coverts; dusky primaries edged gray, giving lower wing when folded a bluish-gray appearance in contrast to olive-green back; some specimens have outer edges of secondaries and outer webs of tertials olive-green; tail gray, three outer feathers on each side largely white (variable in position and amount) on inner webs, with sometimes a white spot on 4th or even on 5th; wing linings whitish with some dusky markings near outer edge; bill black in spring, lighter and often paler below in

[1] Birds of the New York City Region, 1923, p. 313.

[2] Howell, A. H.: The Birds of Alabama, 1924, p. 286.

autumn; iris dark brown; legs and feet dark bluish, soles yellowish. *Adult male in winter plumage:* Very similar to adult male in spring, but feathers of top of head more or less tipped greenish. *Adult female in breeding plumage:* Similar to adult male, but duller and more olive-green, which covers crown and sometimes even forehead. *Adult female in winter plumage:* Similar to adult female in spring. *Young in first winter plumage:* Much like adult of same sex, and usually practically indistinguishable, but yellow in crown of male rather more veiled by greenish tips; white of wing-bars usually tinged yellow. *Young in juvenal plumage:* Similar to adult above, but duller and darker; color of back, lightening somewhat, extends over lower plumage, darkest on chin, throat and upper breast.

Measurements. — Length 4.50 to 5.00 in.; spread 6.85 to 7.50; folded wing 2.25 to 2.50; tail 1.85 to 2.10; bill .48 to .52; tarsus .61 to .68. Female smaller than male.

Molts. — Juvenal plumage assumed by complete postnatal molt; first winter plumage by partial postjuvenal molt, involving body plumage and wing-coverts, and beginning in early summer; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (July); adults have but one (postnuptial) molt (late June, July).

Field Marks. — Size smaller than Chipping Sparrow. *Adult male: Top and fore part of head, and lower plumage* (except white under tail-coverts) *yellow;* back of neck and back olive-green; wings and tail chiefly bluish-gray, two white or yellowish wing-bars; *black stripe through eye narrowing behind eye.* In Golden-winged Warbler it widens behind eye. *Female and young:* Similar but duller, top of head more olive-green and wing-bars more yellow.

Voice. — Song, *zwee-churr* (R. Hoffmann); also a drowsy locust-like *swe-e-e-e-e ze-e-e-e-e,* the first as if inhaled, the last apparently exhaled; *chc-de-de-e, che-dee-e,* and *chc-de-de-dee,* suggesting Chickadee (F. L. Burns); longer song, *wee-chi-chi-chi-chi, chur, chee-chur* (F. M. Chapman).

Breeding. — In woods or their bushy borders, or in fields close by woods, shrubbery or hedge-rows, or in borders of wooded swamps. *Nest:* On ground, on a foundation of dry leaves, surrounded by bushes, weeds, briers, etc., often at foot of bush; bulky and built of leaves, bark-strips, stems of grasses and weeds, and other vegetal fibers, lined with bark-shreds, laid across instead of around the cup, and often with a lining of fine grass stems laid over these. *Eggs:* 4 or 5; .59 to .70 by .46 to .53 in.; short rounded oval to ovate; white, sprinkled sparingly with delicate specks of "umber, seal-brown, chestnut, lavender and rich purplish shades" (F. M. Chapman); figured by E. A. Capen in "Oölogy of New England," Plate III, Fig. 7, and by F. M. Chapman in "The Warblers of North America," Figs. 12–14. *Dates:* May 15 to 25, Virginia; May 27 to June 10, Pennsylvania; May 20 to June 20, Connecticut; May 29 to June 6, Massachusetts. *Incubation:* Period 10 to 11 days; by female. One brood yearly.

Range. — Eastern United States (west to the Plains), Middle America and extreme northern South America. Breeds from eastern Nebraska, southeastern Minnesota, southern Wisconsin, southern Michigan, northern Ohio, central New York and central-eastern Massachusetts south to eastern Oklahoma, southern Missouri, Tennessee, central Alabama, western North Carolina, southeastern Virginia, Maryland and Delaware; migrates probably across the Gulf of Mexico; very rare in migration in southeastern United States; winters south from central-eastern Mexico (Vera Cruz and Puebla) to Guatemala, Nicaragua and (casually) northern Colombia; occasional in southern Ontario; accidental in Bahamas.

Distribution in New England. — No satisfactory records in northern New England. Rare summer resident or visitor in southern New England. *Vermont:* Possibly accidental; one in the state collection at Montpelier, but unsatisfactorily recorded; Lake Eden, one seen by Dr. A. E. Perkins, August 3, 1919, but no definite record of any specimen actually taken in the state. *Massachusetts:* Many summer records in eastern part, accidental or wanting in western part. Breeding records: Sudbury, May 19, 1909, bird seen May 29, nest found by Eugene E. Caduc, parents raised successfully a brood of four young which left nest on June 18;[1] Brockton, nest found on July 8, 1923, with two young birds nearly ready to leave (they were gone two days later)[2] *Rhode Island:* Rare summer resident. Breeding record:

[1] Wright, Horace W.: Auk, Vol. XXVI, 1909, pp. 337–345.

[2] Carr, Rufus H.: *in litt.*

PLATE 81

PLATE 81

BLUE-WINGED WARBLER

Page 205

GOLDEN-WINGED WARBLER

Page 207

ADULT MALE

ADULT MALE

LAWRENCE'S WARBLER

Page 212

ADULT MALE

BREWSTER'S WARBLER

Page 214

ADULT MALE

NASHVILLE WARBLER

Page 218

MALE

ORANGE-CROWNED WARBLER

Page 221

ADULT MALE

JUVENAL MALE

TENNESSEE WARBLER

Page 223

JUVENAL MALE

ADULT MALE

Allan Brooks.

Gloucester, May 30, 1890, nest taken by C. E. Doe, reported by E. F. Newbury.[1] *Connecticut:* Rare summer resident generally; common to abundant locally in southern part of Connecticut Valley, and near coast from New Haven to Bridgeport.

Season in Massachusetts. — May 12 to September 15.

Haunts and Habits. The Blue-winged Warbler is a shy, retiring species, which commonly keeps near the ground and under cover, and its so-called song is so much like that of a grasshopper or a Grasshopper Sparrow that the bird usually escapes notice. Probably, therefore, it is much less rare than the records indicate. I have many reports of its occurrence scattered over Massachusetts from Worcester County to the coast and north to Essex County, but have seen it here only on Cape Cod.

It frequents low shrubbery, brier patches, bushy fields, neglected pastures, thickets in or near the edges of woodlands, and the edges of open fields near such situations, often on the drier lands, but also on low, swampy or moist lands near swamps and streams, in rank growths of bushes and weeds, and in ravines with running water. It is chiefly a ground warbler, but Dr. B. H. Warren says that in Pennsylvania it visits orchards and gardens when the apple trees and pear trees are in bloom. I have not seen it more than fifteen feet from the ground in a tree, but when the male is in full song on his breeding grounds he frequently takes a higher position in a good-sized tree. He flies occasionally from one tree to another, now and then going a considerable distance, but usually keeping within about one hundred and fifty feet of the nest. Mr. J. B. Canfield says that the mated male has a regular route that he follows from tree to tree, singing his love song in each, that somewhere along this line the female is sitting on her nest, and that when he flies over her he dips down and sometimes alights. The nest may be found by going direct to that spot and searching carefully, for the female is a close sitter and will almost allow the searcher to touch her before she will desert her charge.[2] When the female is surprised on her nest she usually slips quietly away without any attempt to deceive the intruder and lure him away from her treasures.

The young remain in the nest eight or ten days and then leave it never to return, although for a time, until their wings grow strong, they remain in the immediate vicinity.

Little is known definitely of the food of this species. Small insects, such as caterpillars and other larvæ, beetles, ants and spiders are taken, and doubtless many others.

Economic Status. See page 197.

Vermivora chrysóptera (Linnæus). Golden-winged Warbler.

Plate 81.

Description. — Similar in form to Blue-winged Warbler (see page 205). *Adult male in breeding plumage:* Above generally gray or bluish-gray; forehead and greater part of top of head lemon-yellow; sides of head white, with a black stripe running from bill to and below eye, and broadening to a wide patch over ear-coverts; middle and greater wing-coverts largely light lemon-yellow, conspicuous as a

[1] Howe and Sturtevant: The Birds of Rhode Island, 1899, p. 78.

[2] American Ornithology, Vol. II, 1902, p. 55.

large yellow patch on fore wing (sometimes a double patch); flight-feathers and tail-feathers (except gray middle pair) slaty-blackish, outer edges gray; much white toward ends of three outer pairs of tail-feathers; throat (and sometimes chin) black; elsewhere below white, shaded with gray or grayish on sides of breast, sides and flanks; wing linings chiefly white or grayish-white; bill black; iris brown; legs and feet dark brownish; "iris dark brown, bill black, toes and tarsus greenish-brown" (L. Kumlien). *Adult male in winter plumage:* Much the same as in spring, but more or less tinged olive-green above and yellowish below. *Adult female:* Similar to adult male, but duller in color, black of head and throat replaced by gray; gray on sides of breast, sides and flanks usually tinged olive-green, and white below often tinged olive-yellowish, especially in winter plumage. *Young in first winter plumage:* Similar to adults of their respective sexes and practically indistinguishable, but color of upper plumage sometimes more veiled with olive-green edgings and black throat of male slightly veiled at first (July) by grayish or whitish feather-tips. *Young in juvenal plumage:* Above, olive-green, tinged grayish or brownish; wings and tail much as in adult but wing-coverts and edges of tertials olive-green; below variable, pale olive-yellow, sometimes olive-green on lower fore plumage, and grayish to whitish or yellowish-white posteriorly; streak behind eye, chin and throat sometimes dusky in male.

Measurements. — Length 5.00 to 5.30 in.; spread 7.75 to 8.16; folded wing 2.40 to 2.65; tail 2.00 to 2.25; bill .46 to .55; tarsus .70 to .75. Female smaller than male.

Molts. — Practically the same as those of Blue-winged Warbler. (See page 206.)

Field Marks. — Size, same as Blue-winged Warbler. *Adult male:* Formed like Blue-winged Warbler; gray or bluish-gray above with bright yellow patch on forehead and crown, and another on fore wing; throat black, and a large black patch from bill through and below eye extending over ear-coverts; below, mainly white or whitish, tinged gray on sides. *Female:* Duller than male, gray taking the place of black on head and throat. *Young:* Similar to adult, except in juvenal plumage, which is worn but a short time after leaving nest.

Voice. — Alarm note, a sharp *chip;* song, when heard at a distance *zee-ze-ze-ze-ze*, beginning slowly, proceeding faster, and ending at a higher pitch; when near, hard to imitate in type, somewhat like *zee-u-eé-zeé-u-ee-zee-u-eé- zee-u-zweé*, with the *u* barely articulated (J. W. Jacobs); normally of 4 notes, *shree-e-e, zwe, zwe, zwe*, the first about two notes higher than the last three, and slightly prolonged (E. H. Eames); a common song, *dsee dsee dsee* (Bradford Torrey).

Breeding. — In fields abundantly supplied with damp or springy places, with rank thick grass, clumps of bushes, briers, etc., and near-by forest skirted with some large growth (J. W. Jacobs); deciduous woods and thickets, preferring springy runs shaded by gray birches, old pastures growing up to birches, and dry hillsides with young sprouts of oak, hickory or maple. *Nest:* On or very near ground, usually supported by a base of dead leaves and by weed stalks or small stems of some sprout, weed or brier, quite bulky for so small a bird but neatly cupped; built of leaves, bark-strips or shreds, fine grasses and horse-hair or similar material, and lined with criss-cross strips and shreds of inner bark, grasses, etc., or even unlined in some cases; sometimes the upper edge is jagged and apparently unfinished; sometimes the web of the tent caterpillar is used in construction. *Eggs:* 4 to 6, usually 5, very rarely 7; .58 to .73 by .48 to .55 in.; cream-buff to cream-white or white, marked similarly to those of Blue-winged Warbler or those of Maryland Yellow-throat; J. Warren Jacobs gives five shades of brown, also purple, pinkish-vinaceous, vinaceous-buff, vinaceous-lavender and lavender-gray in the colors of shell markings; in some cases the markings tend to form small blotches; figured by E. A. Capen in "Oölogy of New England," Plate III, Fig. 8, by F. M. Chapman in "The Warblers of North America," Figs. 15–17, and by J. Warren Jacobs in "The Haunts of the Golden-winged Warbler," Plate VI, Figs. 1–20 and 24–29. *Dates:* May 14 to June 13, Pennsylvania; May 20 to June 20, Massachusetts. *Incubation:* Period about 10 days (F. L. Burns); by female. One brood yearly. (See Fig. 28.)

Range. — Eastern North America north to southern border of Canadian Zone and west to the Mississippi Valley, Central America and northern South America. Breeds chiefly in Transition Zone from central (casually northern) Minnesota, central Wisconsin, central (casually northern) Michigan,

Photograph by Harry G. Higbee

FIG. 78. — NEST AND EGGS OF GOLDEN-WINGED WARBLER

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Photograph by Miss Cordelia J. Stanwood

FIG. 79. — NEST OF BAY-BREASTED WARBLER

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southern Ontario, central New York, central Vermont, southern New Hampshire and Massachusetts south to northern Missouri, southern Illinois, northern Indiana, southern Ohio, northern New Jersey, southern Connecticut and (in mountains) to northern Georgia; migrates probably across the Gulf of Mexico; very rare or casual as a transient in southern Georgia and Florida; winters from southern Mexico (casually) and Guatemala to Colombia and Venezuela; accidental in Manitoba, Prince Edward Island, Colorado, New Mexico and Cuba.

Distribution in New England. — *Maine:* Winthrop, Mrs. Fred H. Pitman reports seeing the bird three times in June, 1924, but as the bird was not taken, this observation cannot be recorded as a first record for Maine. It is worthy of note, however, that the species was exceptionally common and widespread in New England that season.* *New Hampshire:* Rare visitor in southern part in spring and early summer; possibly very rare summer resident. *Vermont:* Rare spring and summer visitor. *Massachusetts:* Uncommon migrant and locally common to uncommon summer resident, chiefly in eastern part and west at least to the Connecticut Valley. *Rhode Island:* Rare summer resident. *Connecticut:* Uncommon to rare migrant and summer resident, very local.

Season in Massachusetts. — May 3 to September 1.

Haunts and Habits. The Golden-winged Warbler is a beautiful and graceful little bird that nests on the ground or very near it, but often may be seen in tall tree-tops. It is a red letter day when one sees one of these bright wood sprites for the first time. I remember well my first specimen as I saw it creeping out to the end of a nearly horizontal limb of a tall tree. I had never been able to find one in the shrubbery that they usually inhabit, and here was the bird in a tree, where I had never expected to see one.

Mr. Edward S. Coombs, of Malden, probably has found more nests of this species than any other man in Massachusetts. Mr. Horace O. Green, who has spent much time in the field with Mr. Coombs, has sent me an account of the bird's breeding habits in eastern Massachusetts, from which the following extract is taken.

"The Golden-winged Warbler arrives in the vicinity of Boston about the second week in May, but nest building is seldom commenced until after the middle of the month. For their summer home these birds prefer the border of deciduous woods, where tall trees give plenty of shade, to an adjacent clearing with a growth of briers, bushes and grass, and the nest is usually placed just outside the line of the forest proper, but within the shade of the trees. A meadow wholly surrounded by woods is frequently selected. The ideal place to search for a nest of the species is in one of those woodland meadows, which has a clear brook flowing through it, with briers, tussocks of grass and a fresh growth of goldenrod scattered around in profusion, with birch trees and wild grape vines growing near the edges where the meadow meets higher and drier ground, — and all this bordered by tall oak, chestnut and maple trees which furnish an abundance of shade to the vegetation of the meadow itself.

"In such a place during the latter part of May and the earlier days of June will your ear be most likely to catch the notes of this warbler's song, a simple *zeé, zee, zee, zee,* or sometimes this is shortened to *zee, zee, zee,* — in either case the first note being slightly longer than those which follow. Once the note is heard and recognized it is generally

* Since the above was written a specimen has been taken in Maine; Emery Mills, York County, September 6, 1929, an adult male taken by John D. Smith, now in collection Boston Society of Natural History.—J. B. M.

easy to locate the singing male bird, and the chances are that he will soon be discovered on some nearby tree, exploring the tips of the branches searching for food, and occasionally stopping on some twig, standing quite erect, and giving forth his little song, — and frequently he will perch in one place long enough to repeat the song several times before going on his way.

"If the date is not earlier than May 20th nor later than June 15th you may reasonably expect that somewhere on the ground in the immediate vicinity there is a nest of the species, for these birds do not ordinarily wander far from their home during the breeding season.

"The site chosen for the nest varies somewhat, but is generally where it will be in the shade most of the day. The nest is always placed either on the ground, or just slightly above it, and is almost invariably built where a fairly firm support to the sides is supplied by the surrounding vegetation, and frequently the nest is well hidden from view.

"When clusters of fresh goldenrod stems are easily available the Golden-wings seem to prefer this plant to all others in which to place their homes. At the time the nest is built it is frequently possible to see it from a distance of several feet, although from even a short distance it looks simply like a bunch of very dark colored leaves, and in wet weather the leaves look nearly black. But by the time the full clutch of eggs has been laid, the goldenrod has sometimes grown so dense that it is impossible to see the nest without carefully separating the stems of the plant and looking down between them, for the nest is usually down in the center of the cluster.

"By far the easiest way to find a nest of this species is to locate a singing male in a shady meadow where goldenrod grows, and then search the more thickly growing clusters of this plant. Occasionally the nest is placed at the base of a brier or a slender sapling which gives the necessary lateral support. Nests thus built can sometimes be seen much more easily, as there is less vegetation directly in contact with the nest. However, this sort of a location is liable to be on ground which is higher and drier, where ferns, poison ivy and small saplings partially conceal the ground from view, and unless a person bends over and looks in under these obstructions the nest will seldom be seen.

"In Massachusetts the Golden-wings seldom build their homes in grass alone, without some other vegetation to help support the nest, although among the large series of nests which I have examined I found two which were built in meadow grass. One was placed in the coarse meadow grass which grows in scattered tussocks and stands up above the general level of the meadow so that the tops of the tussocks are seldom flooded by the water which collects around them after heavy showers; the grass leaned out from the center of the tussock in all directions and drooped over in graceful curves toward the surface of the water a foot below. The nest, containing five fresh eggs, was built in the center of the tussock and was supported on all sides by the blades of grass, and was entirely open to view from above, except that a small wild raspberry brier leaned slightly over it. Quite frequently a nest of this species is built where a spray of briers or other vegetation hangs over it, even though the base of the spray is not utilized as a support for

the nest. I also found one nest of this species which was situated in a tussock of the fine meadow grass which stands erect and grows quite tall. Very rarely a slender tuft of grass growing wholly within a thick cluster of goldenrod stems is selected. In a backward or late spring season when the goldenrod is not grown enough to furnish suitable shelter at the time the Golden-wings wish to nest, other vegetation such as ironweed or other coarse, rank-growing weed stems are utilized as a nesting site. Sometimes the Golden-wings place their nests in situations identically the same as those chosen by the Maryland Yellow-throat. While hunting for nests of the former we find many nests of the Yellow-throat, which seems to be one of the most abundant of our summer resident birds. However, if closely scrutinized the structure of the Golden-wing's nest is quite characteristic.

"The nest of the Golden-wing usually has a bottom layer of coarse dead leaves on which is placed a ring of large dry leaves, arranged with the points of the leaves downward, so that the leaf stems stick up noticeably around the edges of the nest proper, which is built within and upon this circular mass of leaves, and is made of rather wide strips of coarse grass or rushes, and usually has considerable grape vine bark interwoven in it. The nest lining is coarse and rough, sometimes the eggs being laid on the rough grape vine bark, and in some nests other coarse fibers are used. A very characteristic feature of the nest lining is fine shreds of light reddish-brown vegetable fiber, which at first glance might easily be mistaken for dry needles from the pitch pine, — but careful examination shows it to be the inner layers of the bark from the grape vines. The nest is very bulky for the size of the bird and is rather loosely put together by crossing the materials diagonally, so that it slightly resembles a rather coarse basket-work. I never saw a nest of this species which had a soft lining, such as many other warblers use, — the eggs are apparently always deposited on rough material.

"The general color of the nest is very dark, especially just after a rain, when the materials of which it is composed look almost black, — this being one thing which helps to distinguish these nests from those of the Maryland Yellow-throat, which generally builds a much lighter colored nest, lined with fine grass, and sometimes with horse hair. Another small point of difference which is noticeable on close examination is that the lining in the Yellow-throat's nest is usually of a much finer and lighter colored material, and appears to be woven in horizontally, or at least to show some traces of such a design, especially around the upper edge, — while the Golden-wing closely adheres to the diagonal criss-cross pattern with the loose ends of the nesting materials sticking up at an angle above the rim of the nest cavity."

In feeding, the actions of the Golden-winged Warbler often more resemble those of a titmouse than the ordinary fluttering activity of a warbler. It searches and peers about around twigs and branches, often hanging back downward at the end of a limb and performing many acrobatic feats.

Soon after mating occurs, the nest is hurriedly put together, within two or three days in favorable weather, though should a long storm intervene it may be abandoned and a

new one started in another situation. Often the nest seems unfinished, lacking a completed lining and having ragged edges, but it is home to the little female, who lays an egg daily until the set is complete. Although five eggs is considered a very full set, there are six occasionally and Mr. Green found a set of seven eggs in 1928, which I believe is the largest set of eggs of the Golden-winged Warbler on record.

When the eggs have been laid the female begins at once to incubate. While she is thus engaged the male passes from tree-top to tree-top where with upraised head he gives forth what she doubtless regards as a fine musical effort. In about ten days after hatching the young birds are ready to leave the nest.

Little is known of the food of the Golden-winged Warbler. It eats many destructive caterpillars when they are small, not only canker-worms and other hairless species, but such pernicious pests as the hairy larvæ of the brown-tail moth and those of the gipsy moth.

Economic Status. See page 197.

[Vermivora lawréncei (Herrick). Lawrence's Warbler.]

Contributed by Maurice Broun.

Plate 81.

Note. The present concensus of opinion regarding the status of this bird and Brewster's Warbler is that they are, beyond all doubt, hybrids between the Blue-winged and Golden-winged Warblers. Not only do their peculiar characters show a direct affinity to these species, but their origin has been satisfactorily traced to them. The majority of Lawrence's Warblers recorded closely resemble the type, but intergrades occur which may bear closer resemblance to either the Golden-winged or the Blue-winged Warbler.

Description. — A Blue-winged Warbler, wearing the characteristic black or dusky throat and head markings of the Golden-winged Warbler. *Adult male in breeding plumage:* Forehead and fore part of crown brilliant yellow; chin, wide cheek stripe and lower parts of body, yellow; under tail-coverts white; lores, region below eye and ear-coverts, black; throat and upper breast, black, forming a triangular patch, pointed at the chin; back of head, hind neck, back, rump and upper tail-coverts, bright olive-green; wings and tail bluish-gray; middle and greater wing-coverts tipped white, forming two very distinct bands; inner webs of four outer tail-feathers on each side more or less marked with white, inner web of outermost almost wholly white (adapted from Ridgway's description of the type). *Adult female in breeding plumage:* Similar, but forehead dull yellow; wing-bars white tinged with yellow; throat and upper breast dusky-olive-green.

Range. — Breeds in northern New Jersey and southeastern New York eastward to the Connecticut Valley in Connecticut; in migration recorded south to southern Maryland; winter range unknown.

History. In 1874, a beautiful male of this warbler, having been taken in May of that year on the Passaic River, near Chatham, New Jersey, was found in the collection of Mr. D. B. Dickinson, and shortly afterwards described as a distinct species by Mr. Herold Herrick.[1] During the succeeding twenty years about a dozen more specimens

[1] Proceedings, Academy of Natural Sciences of Philadelphia, 1874, p. 220.

came to light, but as no definite knowledge of the bird's history was forthcoming, its validity as a species was questioned, and, together with Brewster's Warbler, it was consigned to the hypothetical list of the second edition (1895) of the Check-List of the American Ornithologists' Union. Meanwhile, these birds aroused widespread interest in ornithological circles. The subject of their possible relationship with the Blue-winged and Golden-winged Warblers became a moot question, evoking considerable theorizing and speculation among eminent ornithologists. However, the cloud of obscurity that has hung over the status of these birds for many years, has at last drifted away. Their hybridity has been proved, and consequently they have been dropped from the latest (1910) edition of the Check-List of the American Ornithologists' Union.

Lawrence's Warbler is a much rarer bird than Brewster's, and occurs in a more restricted area. Its numbers seem to be concentrated in central and southern Connecticut, and more or less so in southeastern New York and northern New Jersey. The ranges of the Golden-winged and Blue-winged Warblers overlap in this territory, thus favoring a condition for the production of hybrids between these two closely related species. Lawrence's Warbler has been taken near the District of Columbia, and there are three published sight records for Massachusetts. The first of these is that of a second year male identified at Roslindale, in May, 1905, by Mrs. Julia W. Sherman;[1] another on May 27, 1908, at Dedham, a bird seen by Miss Jessie E. Kloseman;[2] and the last, a male, identified by Mr. C. J. Maynard and others on September 24, 1910, at Waverly (Belmont).[3]

This bird would hardly be expected to have any distinctive features of its own, for it is essentially a Blue-winged Warbler, with similar nesting habits, haunts and song. It associates with both parent species, and has been found mated with the Blue-winged Warbler, but there is no record of a pair of Lawrence's Warblers having established conjugal relations. The first knowledge of its home life was obtained in 1904, when a male mated with a female Blue-winged Warbler in the New York Zoölogical Park. According to Mr. C. W. Beebe, this union produced "six vigorous young birds . . . all in typical nestling plumage of *H. pinus*, showing no traces of the black markings of *H. lawrencei*." He also observed that the bird's song closely resembled that of a Blue-winged Warbler. "An acute ear, however, could detect that the first phrase was a typical *chrysoptera* syllable, while the second was a perfect *pinus* syllable, thus: *shree-e-e, zwee-e-e-e*, the first syllable penetrating and somewhat harsh, the second long-drawn, dreamy and wheezy."[4] This same pair was independently observed by Mr. Isaac Bildersee, whose description of the song tallies very well with that of Mr. Beebe.[5] Mr. Edwin H. Eames writes: "The only *H. lawrencei* I ever knowingly listened to . . . favored me with its song for nearly two hours, and during the several hundred repetitions, it never varied in the least particular from the characteristic song of *H. pinus*, its song

[1] Maynard, C. J.: Record of Walks and Talks with Nature, Vol. IX, 1917, p. 35.
[2] *Ibid.*, Vol. I, 1908, p. 68.
[3] *Ibid.*, Vol. III, 1910, p. 150.
[4] Auk, Vol. XXI, 1904, pp. 387, 388.
[5] Bird-Lore, Vol. VI, 1904, pp. 131, 132.

consisting of two drawling notes, *see-e-e-e, zwee-e-e-e-e*, with a very decided *z* sound. The first series is somewhat higher pitched than the last and hardly as long continued." [1]

Further observations relative to the history of Lawrence's Warbler, and the astonishing marital relations of this quartet of *Vermivoræ*, are treated below under Brewster's Warbler.

[Vermivora leucobronchiális (Brewster). Brewster's Warbler.]

Contributed by Maurice Broun.

Plate 81.

Note. The following description of this hybrid concurs with the plumage pattern and coloration of typical specimens, which are comparatively rare. There are, however, numberless intergradations of plumage connecting the two parent forms. Most intergrades tend to approach the Blue-winged Warbler in coloration, and may have the lower plumage extensively washed with yellow, especially on the breast, and the back more or less tinged with olive-green. The wing-bars are variable also, being almost white in some cases. Specimens tending toward the Golden-winged Warbler show an expansion of the eye-line, so that it may resemble the characteristic head marking of that species, but rarely is there any indication of a dark throat patch. (See "*Note*" under Lawrence's Warbler.)

Description. — In general coloration resembles the Golden-winged Warbler, but differs in having a plain white throat, and a narrow black or dusky eye-line, as in the Blue-winged Warbler. *Adult male in breeding plumage:* Forehead and fore part of crown bright yellow; narrow line from bill through and a trifle below eye, black; rest of upper plumage, gray; greater and middle wing-coverts yellow or white, forming a broad patch; rest of wings grayish, with more or less olive-green edgings; inner webs of three to four pairs of tail-feathers on each side marked with white; line above eye, throat, cheeks and entire lower plumage white, breast sometimes tinged with yellow; bill black; iris brown; legs and feet dark brown. *Adult female in breeding plumage:* Similar to adult male, but forehead and crown duller; plumage more or less tinged with olive-green above, and with yellow below, especially on breast; eye-line duskier.

Range. — Eastern United States. Breeds from Michigan, southern New York and Massachusetts south to Ohio and New Jersey; during its migrations this bird has been found in northern New York, Pennsylvania, Maryland, Virginia, North Carolina, Missouri and Louisiana. There are no winter records.

History. Probably no other North American bird has excited as much protracted controversy as Brewster's Warbler. During the last quarter of the past century and the first decade of the present, its exact status offered a most perplexing problem for ornithologists to solve. By 1904 it was consoling to have gleaned some enlightening facts about Lawrence's Warbler, but the Brewster's or White-throated Warbler, as it was originally called, remained an inscrutable mystery. Its peculiar variations in plumage, and local distribution, and its association with the Blue-winged Warbler and Golden-winged Warbler, called forth from many authorities various hypotheses, explanations and suppositions accounting for its origin, but most of these only tended to complicate the whole matter.

The type specimen, a male of this interesting warbler, was taken at Newtonville, Massachusetts, on May 18, 1870, by Mr. William Brewster, and was subsequently

[1] Auk, Vol. VI, 1889, p. 309.

described by him as a new species.[1] This bird was rapidly succeeded by others collected from scattered localities in southern New England, New York, New Jersey, Maryland, South Carolina, Pennsylvania, Virginia and Michigan; and specimens have been secured from points as distant as Louisiana and Missouri. However, the center of distribution is in the lower reaches of the Connecticut and Hudson River valleys. Two specimens antedating the type have been exhumed from old collections. One of these, having an interesting history, will be referred to later.

In 1881 Mr. Brewster advanced the theory that both Brewster's and Lawrence's Warblers were hybrids between the Golden-winged Warbler and Blue-winged Warbler. His grounds for this belief were that the supposed hybrids occurred within a breeding area occupied by both the above named species; that their characters were not original, but inconstant, and obviously borrowed from the supposed parent forms; and that complete stages of intergradation connecting Brewster's and the Blue-winged Warbler indicated their affinity.[2] Mr. Brewster's perspicacity led him to adhere steadfastly to this conviction, which ultimately proved to be the correct one.

Mr. Robert Ridgway, admitting the hybridity of Lawrence's Warbler, maintained that Brewster's Warbler was a distinct species, because the bird "in its pure white throat, in very striking contradistinction to the deep gray or black throat of one and bright yellow throat of the other alleged parent, certainly does possess one very important original character, which it is impossible to conceive can be derived from the crossing of the two species in question." He believed that the puzzling "aberrants," the innumerable gradations between *pinus* and *chrysoptera*, were produced from an interbreeding of Brewster's Warbler with its allies.[3] Later, Mr. Ridgway adopted the view that hybridism did enter into the question of their origin, but that Brewster's Warbler was probably a white phase of the Blue-winged Warbler and Lawrence's Warbler a yellow phase of the Golden-winged Warbler, or, that all four forms were merely two dichroic, hybridizing species.[4]

Mr. Gerald Thayer, in 1902, favored Mr. Ridgway's former, as well as later opinion, in part, stressing the proposition that Brewster's Warbler was either a distinct species or a color phase.[5] Three years later, Dr. Louis B. Bishop decided that the bird was a leucochroic or white phase of the Blue-winged Warbler and nothing else.[6] Both of these gentlemen, however, held to the generally accepted belief that Lawrence's Warbler was a hybrid.

That both these perplexing birds were neither hybrids nor color phases, but "incipient species" newly evolved from the Golden-winged Warbler, was the firm conviction of Mr. Charles J. Maynard. His "fatal objection" to the hybrid theory consisted in the

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[1] American Sportsman, Vol. V, 1874, p. 33; and Bulletin, Nuttall Ornithological Club, Vol. I, 1876, p. 1.
[2] Bulletin, Nuttall Ornithological Club, Vol. VI, 1881, pp. 218–225.
[3] Auk, Vol. II, 1885, pp. 359–363.
[4] Ridgway, Robert: A Manual of North American Birds, 1887, p. 486.
[5] Auk, Vol. XIX, 1902, pp. 401, 402.
[6] Auk, Vol. XXII, 1905, pp. 21–24.

application of the natural law that different species of birds, when mated together, are usually sterile, but if they are fertile, their offspring are invariably sterile. This is usually true, but here is an extraordinary exception to this well known rule, where two separate, yet closely related species interbreed and produce fertile offspring, these in turn breeding back with the parent stock, being apparently infertile among themselves; we know of no other record of such an instance. Another of his plausible objections, intended to controvert the theory of dichromatism, "local dichromatism being unknown among birds," was that Brewster's Warbler and Lawrence's Warbler were not found over the entire region which represented the overlapping ranges of the supposed parent forms, but their distribution was confined to a limited area. Finally, Mr. Maynard proposed that doubtful hybrids were atavistic, combining the characters of the Golden-winged Warbler and some remote ancestor. In tracing their derivation from this warbler he placed great importance in his discovery, as an infallible clue, that the white spot on the inner web of each second tail-feather of this species was also present in a large proportion of the two birds under discussion.[1]

An entirely different argument was propounded in 1905, by Mr. William E. D. Scott, who attempted to apply de Vries' theory of mutation in explanation of the origin of these birds. He assumed that they came into existence "early in the last century" as two distinct mutants from the Blue-winged Warbler.[2] This notion was immediately refuted by Dr. J. A. Allen, who demonstrated its impracticability.[3]

In 1908, the last stage of theorizing was reached by Dr. Charles W. Townsend, who from personal observations emphatically declared that Brewster's Warbler was not a color phase of the Blue-winged Warbler but that it was either a hybrid resulting from the union of *pinus* with *chrysoptera*, or a dimorphic or atavistic form of the latter. Since the black throat of the Golden-winged Warbler was evidently a secondary character of recent development, the white throat of Brewster's Warbler must be an inherited ancestral character.[4]

During all this discussion a score of observations were published relative to alliances between the Golden-winged Warbler and the Blue-winged Warbler, or between one of these and Brewster's Warbler or Lawrence's Warbler. Yet, even this accumulated evidence was lacking, for the most part, in definite details, so that very little of it was sufficiently convincing or conclusive in determining the exact status of the two latter birds.

Until 1908, the employment of Mendel's Law of Heredity as a possible solution to the problem of the origin of Brewster's Warbler and Lawrence's Warbler, appears to have been overlooked. In that year, Mr. John T. Nichols, taking for granted the hybrid parentage of these birds, found that their existence and "relative abundance" was in accord with the functioning of the Mendelian Law.[5] Thus, briefly, when pure *pinus* mates with pure *chrysoptera*, the result should be a homogeneous brood of *leucobronchialis*,

[1] Maynard, C. J.: Birds of Eastern North America, Revised Edition, 1896, pp. 576–578; and Warblers of New England, 1905, pp. 83–88.

[2] Science, Vol. XXII, 1905, pp. 273–280.

[3] *Ibid.*, pp. 431–434.

[4] Auk, Vol. XXV, 1908, pp. 65–68.

[5] *Ibid.*, p. 86.

a Mendelian so-called dominant hybrid; when impure *pinus* is mated with pure *chrysoptera*, the progeny should be *chrysoptera* and *leucobronchialis* in equal numbers; pure *pinus* when paired with impure *chrysoptera* should give birth to *pinus* and *leucobronchialis* in equal numbers, while a mixed impure parentage of *pinus* and *chrysoptera* should produce equal numbers of *pinus*, *chrysoptera*, *leucobronchialis* and *lawrencei;* the last named manifests the recessive character of *lawrencei*, and its proportionately greater rarity is thus explained.

Now we come to the solution of this vexatious and bewildering problem. Brushing all theoretical tangles aside, tangible indisputable testimony bearing on the relations of these birds is to be found in Dr. Walter Faxon's conclusive observations. "In the summer of 1910, there bred within the confines of a swamp of about fifteen acres in Lexington, Mass., a pair of Golden-winged Warblers, and two male Golden-winged Warblers mated with two female Brewster's Warblers. . . . The progeny of the three pairs were closely observed from the juvenile (in one case, from the natal) plumage up to the first winter plumage, when the adult characters were acquired; the young of the pair of Golden-wings were all Golden-wings; one of the Brewster's Warblers that was mated with the Golden-wing brought forth a homogeneous brood of Brewster's Warblers, while the other produced a mixed brood of Brewster's Warblers and at least one Golden-winged Warbler. A striking thing about it was this: the young birds of mixed parentage were absolutely pure in plumage, — either Brewster's Warblers or Golden-wings, without any tendency to combine, as 'intermediates,' the characters of the two parents. They appeared to exemplify the transmission of characters in accordance with Mendel's Law. . . ." Three years later Dr. Faxon and Dr. Winsor M. Tyler had the good fortune to observe in the same locality the mating of a typical male Golden-winged Warbler with a typical female Blue-winged Warbler. The number of young resulting from this match is not stated, but they all matured into Brewster's Warblers; thereby both observers "had the full satisfaction of demonstrating the true nature of Brewster's Warbler and removing the question forever from the realm of conjecture." At the same time they found a male Brewster's Warbler mated with a female Golden-winged Warbler and as in one of the above cases (except for the inverted parentage), the offspring were Brewster's Warblers and one male Golden-wing.[1] (For a detailed, comprehensive summary of Dr. Faxon's observations on these strange interbreedings, extending through a number of years, see the Auk, Vol. XXXIV, 1917, pp. 481, 482.)

In his admirable monograph on Brewster's Warbler, published two years prior to the above observations, Dr. Faxon adds "half in jest," after adducing abstracts of the different hypotheses, "I do not see that there is anything left for a new aspirant to honors in guessing unless it be the conjecture that *Helminthophila* (*Vermivora*) *pinus* and *Helminthophila* (*Vermivora*) *chrysoptera* are themselves nothing but southern and northern dichromatic forms of one and the same species!"[2] Not long afterwards, Dr. Faxon learned that Audubon suspected that these two birds were one species! "That Audubon

[1] Memoirs, Museum of Comparative Zoölogy, Vol. XL, No. 6, 1913, pp. 311–316. [2] *Ibid.*, No. 2, 1911, p. 68.

at that early date [1835], ignorant (as he was assumed to be) of the existence of Brewster's and Lawrence's Warblers, and but superficially acquainted with the Golden-wing, should suspect that two birds so diverse as the Blue-wing and the Golden-wing were one species seemed incomprehensible, and in the light of what we now know about these birds, his surmise seemed to presuppose an almost superhuman faculty of prevision." [1]

Returning now to the interesting history of the very first specimen of this warbler ever taken, a bird discovered by Dr. Spencer Trotter in the collection of the Academy of Natural Sciences of Philadelphia, we learn that it was collected about 1832 by J. G. Bell, who later disposed of it. The specimen eventually found its way to the Academy and was received without a tag by John Cassin, who wrote on the bottom of its stand, "J. C., 20 October, 1862," and, in obscure handwriting, "Not [note?] from Bell." [2] Dr. Faxon suggests that as Audubon and Bell were "intimately acquainted," it is possible that Audubon examined this bird, and, marking its resemblance to both the Blue-winged Warbler and Golden-winged Warbler, "may have inferred the interbreeding of these two birds, and so (rather unwarrantably, it is true) their identity." [3]

Brewster's Warbler, like Lawrence's, reproduces the songs of either the Blue-winged or the Golden-winged Warbler. Mr. Edwin H. Eames furnishes the following: "Seven birds, typical of *H. leucobronchialis*, expressed their good spirits by precisely the song of the preceding (*H. chrysoptera*) except in one trifling point. Another, with a bright yellow breast-patch, had, in addition, a few original variations of its own. Still another, with a close resemblance to *H. pinus*, repeated songs of *H. chrysoptera* only, but they were all harsh and disagreeable in comparison. . . . A perfectly typical bird repeated but one style of song. This surprised me greatly, it being precisely the same as the common song of *H. pinus*. I heard this many times on two different occasions before shooting the bird, and it was always the same. But one more bird, with a faint greenish-yellow color on the back, a strong patch of yellow on the breast, and a wash elsewhere on the under parts, used the latter song exclusively." [4]

Readers wishing to learn more about the nesting of this bird, are referred to an interesting article, entitled, "A Brewster's Warbler and his Brood," by T. Donald Carter and R. H. Howland, in the Auk, Vol. XL, 1923, pp. 423–430.

Vermivora ruficapilla ruficapilla (Wilson). **Nashville Warbler.**

Plate 81.

Description. — Form similar to that of Blue-winged Warbler; no obvious wing-bars or spots on tail, tail slightly forked. *Adult male in breeding plumage:* Top, *back and sides of head and neck* gray with a patch of chestnut on top of head, only partly concealed by gray feather-tips; lores pale grayish; eye-

[1] Memoirs, Museum of Comparative Zoölogy, Vol. XL, No. 6, 1913, p. 315.

[2] Proceedings, Academy of Natural Sciences of Philadelphia, 1877, p. 292; Bulletin, Nuttall Ornithological Club, Vol. III, 1878, p. 44, and Vol. IV, 1879, p. 59.

[3] Memoirs, Museum of Comparative Zoölogy, Vol. XL, No. 6, 1913, p. 316.

[4] Auk, Vol. VI, 1889, p. 309.

ring conspicuously white; elsewhere above chiefly bright olive-green, brightest on rump and upper tail-coverts; wings and tail mostly dark grayish-brown, with olive-green edgings, but no wing-bars; the only whitish on tail is on edges of inner webs and, in some cases, extreme tips; below, bright gamboge-yellow, paling to white on lower abdomen; wing linings chiefly yellow; bill dusky or brownish-gray paling at base below; iris dark brown; legs dark brown, feet olive-gray. *Adult male in winter plumage:* Similar to adult male in spring; chestnut crown veiled with gray; back grayer; breast tinged brownish. *Adult female in breeding plumage:* Similar to adult male in spring but duller in color and little chestnut on head; "upper mandible blackish-violet-gray, lower pale olive-buff; tarsi light yellowish-olive, toes underneath olive-yellow" (F. B. White). *Adult female in winter plumage:* Varies from spring plumage in the same manner as adult male. *Young in first winter plumage:* Resembling adults of their respective sexes in winter plumage, and sometimes perhaps indistinguishable from them, but usually much duller in color, the female without chestnut on top of head. *Young in juvenal plumage:* Chiefly brown above, becoming darker brown tinged olive on back, and olive-green on rump; below, yellowish-brown or olive-brownish, shading into pale yellow on abdomen and under tail-coverts; wing-feathers and tail-feathers edged with olive-green, and middle and greater wing-coverts tipped with buffy-yellow, forming two narrow inconspicuous buffy wing-bars; lores and ear-coverts brownish-gray; eye-ring pale buffy; "bill and feet pinkish-buff, dusky when older" (J. Dwight).

Measurements. — Length 4.50 to 5.00 in.; spread 7.30 to 7.75; folded wing 2.22 to 2.50; tail 1.60 to 2.25; bill .41 to .47; tarsus .60 to .67. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (July, August) involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt, involving mainly head and throat; adult winter plumage by complete postnuptial molt (July, early August); adults acquire winter plumage by complete postnuptial molt, and breeding plumage probably by partial prenuptial molt (March) as in young birds.

Field Marks. — Size, smaller than Chipping Sparrow; seems considerably smaller; smaller than other warblers of this genus. *Adult male:* Head ashy or gray, with veiled chestnut crown-patch, rarely visible in the field; back distinctly olive or olive-brown; chin, throat and other lower plumage chiefly plain unstreaked bright yellow; a white eye-ring; the Connecticut Warbler has a white eye-ring but not a yellow throat, and is much larger; (see also *Field Marks* under Tennessee Warbler, page 224). *Adult female and young:* Similar, but duller, no visible crown-patch; the eye-ring buffy. *Juvenal birds:* Brownish below with narrow buffy wing-bars.

Voice. — A very small dry *ehip*, a more metallic louder *chip*, it also "chippers" (G. H. Thayer); song begins like a Black and White Warbler or a Redstart, and ends with two or three quick phrases running down the scale, *wee-tse wee-tse wee-tse wee-tse; ehiddle ehiddle ehiddle* (R. Hoffmann); or *weé-see-weé-see, wit'-a-wit'-a-wit'* (H. D. Minot); first half sibilant, last half a twitter (Miss I. M. Paddock); sometimes the last part is omitted, and it has several variations; also a flight song.

Breeding. — In open moist woods, old neglected fields and pastures grown up to shrubbery, ferns and birches, about a sphagnum swamp or in thickets near edges of woodlands; sometimes on "dry and somewhat barren tracts, sparsely covered with gray birches, oaks or red cedars, or with scattered pitch pines" (William Brewster). *Nest:* On ground, sometimes sunken, and concealed by grasses, leaves, ferns or moss or in a tussock of sphagnum, always well concealed; constructed of bark-strips, grass, leaves, pine needles, moss or similar materials, and lined with fine rootlets or pine needles and grass, rarely with hair. *Eggs:* 3 to 5; .56 to .65 by .45 to .55 in.; ovate to short rounded ovate; white to creamy-white, with small spots and specks of reddish-brown and lilac, often tending to form a wreath around large end; figured by E. A. Capen in "Oölogy of New England," Plate III, Figs. 9, 10, and by F. M. Chapman in "The Warblers of North America," Figs. 23–25. *Dates:* May 30 to June 8, southern Connecticut; May 21 to June 21, Massachusetts; May 25 to June 8, New Hampshire; June 3 to July 10, Maine. *Incubation:* Period slightly more than 11 days (O. W. Knight); by female. One brood yearly.

Range. — Central and eastern North Ameriea north to southern border of Hudsonian Zone and Cen-

tral America. Breeds in Canadian and Transition zones from central Saskatchewan, central Ontario, southern Quebec and Cape Breton Island south to southeastern Nebraska, central Minnesota, northern Illinois, central Michigan, southern Ontario, southern Pennsylvania, northern New Jersey, southern Connecticut and Rhode Island and west to central South Dakota; migrates probably across the Gulf of Mexico; winters from central-southern Texas through eastern Mexico to Guatemala, and (casually) in southern Florida; not common on the Atlantic slope south of Chesapeake Bay; accidental in Greenland.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common migrant and summer resident. *Massachusetts:* Common migrant; less common summer resident. *Rhode Island and Connecticut:* Common migrant; uncommon summer resident.

Season in Massachusetts. — April 27 to October 19. Winter record: Swampscott, January 31, bird found dead by Walter Faxon, where it had been hung by a shrike, apparently had been dead about two weeks.[1]

Haunts and Habits. This beautiful, bright and sprightly little bird was named the Nashville Warbler by Alexander Wilson, who first discovered it in 1808 near Nashville, Tennessee. How inappropriate is the name when we realize that the bird is not known to breed in Tennessee. Its specific name *ruficapilla* or "red-haired" is much more fitting.

Wilson found the bird very rare in the southeastern states, where it always has been rare, because when it leaves New England for its southern journey, it follows down the western side of the Alleghanies, and then turns toward Mexico, returning by the same route. Thomas Nuttall never saw the bird when he lived at Cambridge, Massachusetts, where he taught at Harvard College from 1825 to 1834. Dr. Samuel Cabot, who was at the college from 1832 to 1836, told Mr. William Brewster that he was very sure that the bird did not occur regularly in eastern Massachusetts at that time, but that in 1842 it was so abundant that he shot ten in one morning. I found the species more common in eastern Massachusetts in the latter quarter of the last century than it is today, but its numbers, like those of all birds, are subject to fluctuation.

This bird rarely arrives in New England until the first week in May, and its principal numbers come later in the month. In migration it may be found at times in places where trees and bushes grow. Among its favorite haunts are the bushy edges of woodlands, whether along roads, railroads or streams, or about ponds, lakes, marshes, swamps or open fields. It may often be found among willows, alders, birches or poplars. Old neglected fields and pastures, with scattered growths of birches and bushes, are favorite feeding grounds, but the bird also visits orchards, gardens and shade trees, even in city parks. It may be found on dry lands where scattered pitch pines grow, and on moist lands with rank shrubbery.

Soon after arrival the males are in full song, a simple ditty which some have likened to the songs of the Yellow Warbler and the Chestnut-sided Warbler, but I have never traced to the Nashville Warbler any song which to my ear resembled that of either of the former birds. The song is distinctive, whether the bird is in flight or sitting, and although it has some slight variations the first two examples given above under *Voice* represent

[1] Auk, Vol. VII, 1890, p. 409.

it to my ear better than any other printed rendition that has come under my notice. Strange as it may seem, however, it is rarely the case that two men hearing the same bird and acting independently will write down the same syllables in transcribing its song.

The birds are very active. For about two weeks they are common and then most of them pass northward, leaving comparatively few of them to mate and nest in extreme southern New England, where they are common only locally in the breeding season. June is the principal nesting time, and the female is the principal nest builder. The nest is so well concealed and the female sits so closely that her little home is difficult to find, and it is only by watching the female carrying building material or by quietly sitting down until she goes to the nest that it is ever found, unless one chances upon it suddenly in such a way as to drive the sitting bird off. Professor O. W. Knight says that it takes seven to nine days to build the nest, that an egg is laid each day thereafter, usually between six and ten A.M., until the set is complete, and that incubation begins as soon as the first egg is laid. While the female is incubating, the male occupies a large part of his time in singing from near-by tree-tops, though in one case he was seen to feed his mate on her nest. Both parents feed the young, which are ready to fly in about ten or eleven days. As soon as they can fly well the whole family, keeping together, explores the ground, the grass, weeds and shrubbery, and when in August all have molted, the southward migration begins. They join with small bands of other warblers and all follow the retreating sun southward. Some few are still passing through southern New England until early October, after which only an occasional straggler may be seen.

The food of the Nashville Warbler has not been fully determined. As the bird ranges from the ground to the tree-tops it takes most of the insects that any warbler will eat, among them flies, young grasshoppers and locusts, leaf-hoppers and many plant-lice, caterpillars both hairless and hairy, among them the gipsy, brown-tail and tent caterpillar, most of which are taken when young and small; also small wood-boring beetles are eaten, and other small insects of many species. The bird appears to be almost wholly insectivorous.

Economic Status. See page 197.

Vermivora celâta celata (Say). Orange-crowned Warbler.

Plate 81.

Description. — Form similar to that of the Blue-winged Warbler; no white spots on tail. *Adult male in breeding plumage:* Above, grayish-olive-green, becoming brighter or more yellowish-olive-green on rump and upper tail-coverts; dusky spot before eye; tawny or brownish-orange patch on top of head, veiled except in mid-summer by grayish-olive feather-tips; wings and tail darker or dusky, outer edges of all their feathers colored much like back; eyelids and inconspicuous stripe over eye, yellow; below, light greenish-yellow or olive-yellow, paling to whitish (narrowly) in center of abdomen and about vent; sides of neck, head and breast light grayish-olive-green, upper breast and sometimes throat indistinctly streaked with same; wing linings and under tail-coverts pale yellow; bill dark gray; iris dark brown; feet olive-

gray, soles yellowish (Allan Brooks); bill dark brown above, lighter below; legs and feet dull brown, soles yellowish (L. Kumlien). *Adult male in winter plumage:* Similar to adult male in spring, but somewhat darker, owing to more extensive gray feather-tips. *Adult female in breeding plumage:* Similar to adult male, but usually, if not always, duller in color and crown-patch restricted or not obvious. *Adult female in winter plumage:* Similar to adult female in spring, but differing precisely as does male, more dusky generally. *Young in first winter plumage:* Similar to adults of their respective sexes in fall and winter, but crown-patch of brownish mostly or entirely concealed by grayish-green feather-tips, and usually lacking in female; immature birds become as adults in first breeding plumage. *Young in juvenal plumage:* Somewhat similar to adults, but browner or grayer above; lores, eye-ring and ear region "mouse-gray," crown-patch lacking; wing with two pale bars; throat, breast and sides of breast grayer.

Measurements. — Length 4.60 to 5.30 in.; spread 7.10 to 8.25; folded wing 2.10 to 2.90; tail 1.75 to 2.00; bill .43 to .51; tarsus .60 to .70. Female smaller than male.

Molts. — Similar to those of Nashville Warbler, except that first breeding plumage is acquired chiefly by a molt of fore part of head and chin, and that the molt of females into first breeding plumage "is more or less suppressed" (J. Dwight); young birds molt into first winter plumage in August.

Field Marks. — Size smaller than Chipping Sparrow and more slender. Usually seen in New England in autumn; a *very plain bird*, without conspicuous markings of any kind; "orange" crown so veiled that it is seldom seen in the field; difficult for the beginner to identify; distinguished from Nashville Warbler by *greenish-yellow* lower plumage, with very faint broad dusky streaks; Tennessee Warbler usually may be distinguished by more distinct markings on side of head, particularly a white or yellowish stripe over eye, dark line through it and its *white under tail-coverts*, but young are difficult to distinguish in the field from those of Orange-crowned Warbler (see *Field Marks* under Tennessee Warbler, page 224).

Voice. — Call or alarm note, a sharp *chip*, also "a faint squeak" (Charles Bonaparte); song, loud, emphatic, rather monotonous *chicky-tick-tick-tick-tick* (J. M. Wheaton); *chip-é, chip-é, chip-é, chip-é, chip-é* (E. T. Seton); *chee, chee, chee, chw'-chw'*, ending abruptly on a rising scale, first three syllables rapid, last two slow (Lynds Jones).

Breeding. — In undergrowth and open thickets. *Nest:* On ground, in low bushes, sometimes on bank or steep slope; composed of grass, weeds, etc., lined with hair, fur or fine grasses. *Eggs:* 4 or 5; .60 to .70 by .45 to .50 in.; white, dotted with reddish and purplish-brown; figured in "Nature Lovers Library, Birds of America," Plate No. Four, Fig. 12. *Incubation:* No data.

Range. — Eastern and central North America to northwestern Alaska and Mexico. Breeds in Hudsonian and Canadian zones from tree limit in northwestern Alaska, northern Mackenzie and northern Manitoba south to southwestern Alaska (Alaska Peninsula), central-eastern Alaska, northern British Columbia, central Alberta, southern Saskatchewan, southern Manitoba, southeastern Ontario and southern Quebec; migrates chiefly over the eastern and central parts of North America, but is rare on the Atlantic coast; winters from central-southern Texas, southern Louisiana, central Tennessee and northeastern North Carolina, south to southern Florida and in eastern Mexico to the state of Hidalgo; casual in Washington and Arizona.

Distribution in New England. — Mere straggler in spring; very rare late fall migrant; wintering casually in southern parts in mild winters, where seen in every winter month, and almost daily in winter of 1920–21. No satisfactory record for Maine.

Season in Massachusetts. — May 5 to 15; September 30 to November 28 (winter).

Haunts and Habits. The plainly colored, inconspicuous Orange-crowned Warbler probably is less rare in New England in autumn than it is believed to be. It is exceedingly rare, casual or accidental in spring, as its normal spring route is by way of the Mississippi Valley region. There are very few spring visits recorded in New England, but the fall records are somewhat numerous, some of them remarkably late. Any warbler seen in

November or later in New England and not immediately recognized should be scrutinized very carefully, as most of our reports of this species have occurred in November or winter.

This warbler may be found almost anywhere in New England during the fall migration wherever there are trees and shrubbery. In my experience the bird has been either in the trees or in the tops of rather tall shrubs and never very high, but like other members of the genus, though it nests on the ground it is said to spend considerable time in the upper parts of trees. It seems fond of the edges of woodlands near water, but it also frequents open woods, orchards, fruit gardens and shade trees, where amid the foliage it is very seldom noticed by the ordinary observer. When approached it divides its attention between the observer and its insect prey, which it hunts assiduously in the manner of others of the genus. This warbler may be seen rarely in small companies, but more often singly or in company with a small group of warblers of other species.

Its food habits are little known. Its insect food must be similar to that of the other species with which often it associates, but it must also feed on berries or seeds, or it could not maintain itself in the mildest of our northern winters. Even then it has been known to succumb to hunger, privation and cold, and probably few that attempt to winter in southern New England are successful.

Mrs. G. H. McGregor of Fall River, Massachusetts, who reports that one of these birds appeared frequently at her feeding station throughout the winter of 1920–21, says that during the cold weather the bird ate suet "very eagerly" and that during the latter part of March it was seen with another in a field near-by.

Economic Status. See page 197.

Vermivora peregrina (Wilson). **Tennessee Warbler.**

Other name: SWAMP WARBLER.

Plate 81.

Description. — Form similar to other warblers of this genus; no obvious wing-bars or spots on tail. *Adult male in breeding plumage:* Top of head, nape and hind neck chiefly gray or bluish-gray; former sometimes with traces of chestnut; a whitish stripe above eye, narrowing before eye; rest of upper plumage olive-green; flight-feathers and tail-feathers dusky, edged olive-green, except primaries which are edged gray, and outer tail-feathers usually more or less whitish at end of inner web; edges of inner webs of tail-feathers white or whitish; middle and greater wing-coverts narrowly and inconspicuously tipped with paler or very pale green; sides of head below eye, and sides of neck grayish; below, grayish-white, often tinged buffy or yellowish; sides and flanks more grayish; wing linings chiefly white; bill black or blackish above, bluish below; iris brown; legs and feet dark bluish-gray. *Adult male in winter plumage:* Similar to adult male in breeding plumage, but gray on top of head tinged with olive-green, more buffy or olive-greenish below, and bill lighter basally below. *Adult female in breeding plumage:* Similar to adult male in same plumage, except that top of head is washed with olive-green, and lower plumage more yellowish. *Adult female in winter plumage:* Much as in spring, but top of head without gray. *Young in first winter plumage:* Similar to adults of their respective sexes in winter plumage, and practically indistinguishable from them, but a trifle more greenish above and more yellowish below. *Young in juvenal plumage:* Similar to young of Nashville Warbler, but dusky-olive-green above, lacking the brownish

tinge, and yellowish below with *two broad yellowish-white or whitish wing-bars;* dusky streak through eye, and tail edged with bluish-gray; "bill and feet pinkish-buff, the former becoming dusky, the latter deep sepia-brown with age" (J. Dwight).

Measurements. — Length 4.50 to 5.05 in.; spread 7.40 to 8.31; folded wing 2.35 to 2.75; tail 1.51 to 1.85; bill .43 to .48; tarsus .58 to .73. Female smaller than male.

Molts. — As in Nashville Warbler or closely corresponding (see page 219) with the addition of a prenuptial chin molt in both young and old.

Field Marks. — Size small, near that of other warblers of this genus. *Adult male in spring:* Easily distinguished from other warblers of its genus by white stripe over eye and dark line through it, and gray top of head (without bright yellow below). Our only bird resembling the male closely at this season is the Philadelphia Vireo (see page 184), which has bill more robust and its ridge curved, while the Tennessee has bill nearly straight and needle-pointed. In autumn both old and young Tennessee Warblers, with their greenish-yellow lower plumage, resemble the Nashville and the Orange-crowned Warblers, but they have no prominent eye-ring like the Nashville, and the under tail-coverts are white, except in juvenal birds. To distinguish them then requires time and a good light. "The Nashville is distinctly yellow on the breast and under tail-coverts; the Orange-crowned is pale greenish-yellow with dusky streaks and yellow under tail-coverts; the Tennessee is pale greenish-yellow without streaks, and with the under tail-coverts white" (F. M. Chapman). Also the young Tennessee Warbler is brighter and more yellowish above, especially on head, than the others.

Voice. — Alarm call a *chip* or *tseep;* song a rather rapidly uttered *twipiti, twipiti, twipiti, twipiti, twipiwipiwipiwipiwipiwipi,* first part slow, quickly increasing until syllables run together, and ending in a quick twitter (O. W. Knight); the ending resembles the song of the Chipping Sparrow; the song is loud and unmistakable *Xee Xeé Xeé seé seé seé seé-e-e-e-e* or *K'seé-K'seé xeé xeé seé seé seé-e-e-e-e* (L. A. Fuertes).

Breeding. — Usually on moist, boggy lands, sometimes on dry pine land, or in clearings among bushes or small trees. *Nest:* Resembling that of Nashville Warbler, on ground in moss or grass, composed mostly of grass; sometimes arched over with grass or pine needles, well concealed, often at foot of bush or tree. *Eggs:* 4 or 5; .50 to .70 by .45 to .52 in.; short rounded ovate; creamy-white, speckled with reddish-brown and some inconspicuous lilac spots, with larger spots of reddish-brown, chiefly wreathed about large end; figured by F. M. Chapman in "The Warblers of North America," Figs. 29, 30. *Dates:* June 4, southern Maine; June 15 (newly hatched young), southern British Columbia. *Incubation:* By female. For further description of the breeding habits see "The Tennessee Warbler in New Brunswick," by B. S. Bowdish and P. B. Philipp (Auk, Vol. XXXIII, 1916, pp. 1–8).

Range. — North America north into Hudsonian Zone, chiefly east of the Rocky Mountains, Central America and northern South America. Breeds chiefly in Canadian Zone from southern Yukon, south-central Mackenzie, northern Manitoba, northern Ontario and southern Ungava (central Quebec) south to south-central British Columbia, northwestern Montana, southern Manitoba, northern Minnesota, northern Michigan, central Ontario and northern Massachusetts; winters from southern Mexico (Oaxaca) through Central America to Colombia and Venezuela; migrates apparently largely through Mississippi Valley; occasional in Cuba; accidental in California.

Distribution in New England. — *Maine:* Uncommon to rare migrant; rare summer resident. *New Hampshire:* Rather rare and irregular migrant, occasionally less rare; rare summer resident in northern part. *Vermont:* Rare and irregular migrant; probably casual summer resident. *Massachusetts:* Rare migrant, occasionally more common; possibly casual summer resident on Mount Greylock. *Rhode Island and Connecticut:* Rare migrant.

Season in Massachusetts. — May 7 to June 8 (June 30, July 15 and 16); August to October 1.

Haunts and Habits. The Tennessee Warbler is a very unassuming little bird, with no bright colors or showy spots and no very conspicuous markings. I have found it

mostly in damp, somewhat swampy woodlands, but in migration it goes wherever there are trees, in yards, orchards, cemeteries, parks, villages and the suburbs of cities. Formerly it seemed very rare in southern New England. A considerable movement was noted in the Connecticut Valley in the spring of 1900. Miss Emily B. Adams, of Springfield, Massachusetts, says that at that time it sang frequently for ten days about her home in that city. In recent years (since 1912), the bird has become almost common occasionally in migration. During the five years previous to 1920 it was not uncommon as a transient in eastern Massachusetts, and it has not been at all rare in some subsequent seasons. In spring it may be identified readily by its loud, noticeable and unmistakable song, which is no more musical than that of the Chipping Sparrow. It begins in a rather slow and hesitating manner and ends in a rapid succession of *chips*, like those of the Chipping Sparrow.

Its habits are similar to those of the Nashville Warbler. It is an active insect hunter, feeding on grasshoppers, locusts, caterpillars, grubs, beetles, including weevils, flies, plant-lice, spiders, etc., the eggs of insects and a certain proportion of fruit.

Economic Status. While the food of the Tennessee Warbler has never been thoroughly investigated, the bird is believed to be generally useful, but it has at least one fault from the standpoint of the horticulturist. It punctures ripe grapes and drinks the juice. No serious injury from this source has been recorded in New England, where the bird is comparatively rare, but in several states farther west where it is more common, it has done considerable damage in vineyards. However, Mr. W. L. MacAtee, who investigated the food of individuals of this species that were injuring grapes, found that they were also feeding on insects which are very destructive to the grape, and decided that "from present knowledge" they were "practically entirely beneficial" and that we should without complaint furnish them with what grape juice they cared to drink during the few days in the year in which they thus indulged.[1]

Compsóthlypis americána pusílla (Wilson). Northern Parula Warbler.

Other names: BLUE YELLOW-BACKED WARBLER; USNEA WARBLER.

Plate 80.

Description. — One of the smallest warblers, and unlike those immediately foregoing, well marked and with considerable white in wings and tail. *Adult male in breeding plumage:* Above chiefly grayish-blue, which extends down over sides of head, sides of neck and sides of throat; lores black, both eyelids partly white; middle of back greenish-yellow; tail-feathers and flight-feathers dusky, edged grayish-blue; wing-coverts also dusky, but edged grayish-blue so as to appear chiefly blue, with tips of greater and middle coverts forming two broad white wing-bars; two or three outer tail-feathers on each side with a white patch on inner web near tip; chin and most of throat and breast bright yellow (slightly tinged with brown) fading into white on abdomen, flanks and under tail-coverts; a more or less distinct band of dusky or blackish of variable width, bordered behind by more or less brown yellow-tipped feathers, crosses where throat and breast meet, forming usually a distinct and often abruptly defined patch, from each end of which dusky-bluish or grayish extends down the sides; sides usually more or less tinged or

[1] Auk, Vol. XXI, 1904, pp. 489–491.

spotted with chestnut; bill black above, yellow below; iris brown; legs and feet pale brownish, under sides of toes yellowish. *Adult male in winter plumage:* Similar to same in breeding plumage, but blue feathers more or less tipped greenish, feathers of black throat-band tipped yellow, and more white about and before eye. *Adult female in breeding plumage:* Similar to adult male in same plumage, but duller and paler in color, the blue more greenish, less white on tail; band across upper breast usually absent and restricted if present. *Adult female in winter plumage:* Similar to same in breeding plumage, but blue areas greener. *Young in first winter plumage:* Similar to fall and winter female, but usually duller, with little or no band on breast. *Young in juvenal plumage:* Brownish-olive-gray above; two broad white wing-bars; white or whitish below; bill and feet pinkish-buff, the former becoming dusky . . . with age (J. Dwight).

Measurements. — Length 4.25 to 4.90 in.; spread 7.00 to 7.75; folded wing 2.10 to 2.85; tail 1.40 to 1.85; bill .43 to .50; tarsus .59 to .75. Female smaller than male.

Molts. — Practically same as those of the Tennessee Warbler (see page 224).

Field Marks. — Size, smallest of New England warblers. *Adult male:* The only blue warbler of New England with *yellow back*, but the yellow back is inconspicuous in field; has broad white wing-bars, yellow throat and breast, and dark band where throat and breast join. *Female:* Similar but duller, paler, more washed with greenish above, and throat-band narrower or lacking.

Voice. — Call or alarm note *chip* or *chick*. Song, a buzzing, beady twittering, or as Frank M. Chapman says, a sizzling trill, with several variations, *chip-er, chip-er, chip-er, chee-ee-ee-ee; ze, ze, ze, ti-ti,* or *ki-ze, ki-ze, ki-ze, see-see* (O. W. Knight); *che-a-wee-a-wee-a-wee* (F. L. Burns); a peculiar song, "*zee-zee-zec-zip,* with much emphasis on the *zip*" of such peculiar quality that when once heard it is not soon forgotten (Miss J. Olivia Crowell).

Breeding. — Usually in wooded bogs and swamps, preferring coniferous trees, but using deciduous trees also; breeds where *Usnea* (lichen) grows. *Nest:* In tree, ordinarily from 5 to 30 feet up, and usually composed of a bunch of *Usnea* (commonly called "beardmoss"), hanging from near the end of a limb; this hollowed out by the bird with entrance hole at one side, and sometimes with slight lining of grass or hair; rarely built on a branch among twigs and covered with *Usnea* brought for the purpose. *Eggs:* 3 to 7, usually 4 or 5; .61 to .77 by .44 to .50 in.; ovate to short ovate; white to creamy-white, spotted with chestnut, reddish-brown and grayish which tend to form wreath about large end; figured by E. A. Capen in "Oölogy of New England," Plate III, Figs. 4, 5, and by Frank M. Chapman in "The Warblers of North America," Figs. 31, 32. *Dates:* May 18 to June 22, Connecticut; May 30 to July 5, Massachusetts; May 31 to June 17, Maine. *Incubation:* By female. One brood yearly, possibly sometimes two.

Range. — Eastern North America north to southern parts of eastern provinces of Canada, west to the eastern edge of the Great Plains and south to Central America and the West Indies. Breeds mainly in Transition and Upper Austral zones in northern Mississippi Valley, northeastern United States and southeastern Canada, from northern Minnesota, northern Wisconsin, northern Michigan, south-central Ontario, southern Quebec, Anticosti Island and Cape Breton Island south to eastern Nebraska, Iowa, northern Illinois, northern Indiana, central-northern Virginia, Maryland, New Jersey, southeastern New York, Connecticut and southeastern Massachusetts; winters from northern Florida to Cuba, Porto Rico, Virgin Islands (West Indies), southeastern Mexico and Guatemala; casual in Wyoming and Colorado; accidental in Greenland; a southern race occupies the southeastern states; a western race occupying the southern Mississippi Valley has been separated by Robert Ridgway.

Distribution in New England. — Common migrant; less common, local summer resident. Probably least common in summer in Connecticut.

Season in Massachusetts. — April 23 to October 20 (November 6 to 10).

Haunts and Habits. The Northern Parula Warbler is the smallest warbler in New England. It seems to be a happy little creature, much given to singing in a characteristic

weak, high-pitched, drawly, buzzy voice, which may be heard almost anywhere in our deciduous woods about apple-blossom time or later in May. The singer usually keeps well up in the trees, often near their tops or out at the ends of branches, where, when not engaged in giving his peculiar music to the world, he may be seen climbing, reaching or fluttering among the leaves in pursuit of insect quarry. While the bird is found at times during the migration wherever trees grow, it seems fond of the woods, especially about the shores of lakes and rivers.

When the nesting season comes the Parula Warbler may be found wherever the bearded *Usnea longissima*, which grows largely in low wet land, hangs from the trees. The bird turns up some of the ends of the lichen so that it forms a pocket, and conceals the eggs. The nest appears much like other bunches of moss hanging all about it on the trees. Though it usually shapes its nest from the hanging bunches of *Usnea*, several instances are on record where the nest was built of grass and afterward decorated or covered with *Usnea*. I once discovered a female building a nest saddled on a horizontal branch of an oak tree which overhung a highway in or near Dartmouth, Massachusetts. The foundation of the nest (nearly completed) was chiefly of grass and the bird had begun bringing *Usnea* from the swamp in an apparent attempt to conceal the nest, but there was very little of this material to be seen in the vicinity. I had intended to secure this nest when finished, but on my next visit someone else had taken it. Mr. J. Warren Jacobs records in his "Gleanings," No. IV, that he found two somewhat similar nests in Monongahela County, West Virginia, but these were in spruce trees.

Dr. Anne E. Perkins records that about three pairs come yearly to Collins, New York, where they nest in upland woods where no *Usnea* grows. In 1921 one pair was observed, building a nest somewhat in the form of that of an oriole on the down-hanging branch of a pine tree. The material used was largely skeletonized leaves and pine needles, but the nest was blown down before it was quite finished. Such instances as the above, however, are exceptional. Dr. T. M. Brewer tells us that at times the nest is built in the "long gray lichens" hanging from and against the trunk of the tree. He says also that after the nest is built the male bird, when not engaged in procuring food for his mate, busies himself in the task of improving, strengthening and enlarging the nest.[1] Sometimes the male assists in incubation. The ordinary nest is both beautiful and unique, and would be extremely difficult to find but for the fact that the unsuspicious owners often betray its whereabouts. The nesting tree and sometimes the same nest, may be occupied year after year, but in many cases where the *Usnea* has ceased to flourish in a swamp, the birds have deserted the place. There are now, I believe, a number of swamps in southeastern Massachusetts where *Usnea* grew and where Parulas were formerly found in the breeding season, and where in summer we now look for either in vain.

In the latter part of August when the young have been reared and have grown strong, the leisurely southward migration begins; then these warblers may be seen in company

[1] Baird, Brewer and Ridgway: A History of North American Birds, Land Birds, Vol. I, 1905, p. 210.

with the ubiquitous Black-poll Warblers, and both may be found among gray birches during fall migration, if the birches, as is often the case, are infested with plant-lice. The food of this warbler is similar to that of other warblers that spend much of their time in the trees. It feeds much on small hairless inch-worms, such as the fall canker-worm and the spring canker-worm, and on the younger and smaller hairy caterpillars, such as the gipsy and the tent caterpillar.

Economic Status. See page 197.

Dendroica tigrina (Gmelin). Cape May Warbler.

Plate 82.

Description. — Bill not so straight and attenuated as in warblers of the last genus, ridge curved rather generously, bristles about base somewhat more obvious; wings much longer than tail and pointed; tail moderate, its feathers rather broad, and like those of all members of the genus (except Yellow Warbler) it is spotted with white toward the end, which is nearly even or very slightly forked. *Adult male in breeding plumage:* General ground color above and below, bright yellow, plain on sides of neck and on lower rump, where sometimes greenish-yellow, changing to olive-green on back, where striped with black; usually tinged with chestnut on throat and striped or spotted with black; similarly marked from throat to lower abdomen where it fades to white; top of head black, feathers edged olive, forehead sometimes with traces of chestnut; large patch of chestnut on side of head extending over ear-coverts and sometimes higher, thus shortening the yellow streak over eye; streak through eye blackish; wings and tail chiefly black or dusky, edged olive or olive-green; middle wing-coverts mainly white, and greater coverts edged and tipped same or with grayish, or greenish; tertials also with white or pale edges; lesser wing-coverts and upper tail-coverts blackish with broad olive-green margins; three outer tail-feathers on each side with large spot of white near tip, decreasing from first to third; edge of wing yellow and black; wing linings yellowish-white; bill black; iris brown; legs and feet dark brownish or blackish. *Adult male in winter plumage:* Similar below to adult male in breeding plumage, but feathers of upper plumage margined with grayish and those of lower plumage veiled with whitish. *Adult female in breeding plumage:* Similar to adult male in color pattern, but colors not so bright; top of head olive, streaked black; sides of head pale yellow or yellowish, ear-coverts olive; back olive, very faintly and indistinctly streaked darker; lower rump sometimes bright yellow, but varying to olive, somewhat lighter than back; wings dusky with light olive edgings and two pale wing-bars; tail much as in male; below whitish, fore parts tinged more or less with yellow; throat, sides of upper breast, sides and flanks streaked with dusky or blackish. *Adult female in winter plumage:* Similar to same in breeding plumage, but stronger yellow on rump and breast, black streaks below veiled by whitish feather-margins. *Young in first winter plumage:* Similar to winter adults of their respective sexes, but duller in color and white of tail restricted; male has no black cap nor chestnut on head; female less yellow or none below and streaks on breast of both sexes less sharply defined. *Young in juvenal plumage:* Dark brown above, tinged olive on back; wings and tail similar to adult, but edgings browner, and less white on tail; below mouse-gray, breast and sides streaked or mottled with dusky; abdomen and under tail-coverts dirty yellowish-white; "bill and feet pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 4.70 to 5.65 in.; spread 7.60 to 8.50; folded wing 2.33 to 2.85; tail 1.63 to 2.15; bill .46 to .50; tarsus .65 to .76. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (July) involving body plumage and wing-coverts; first breeding plumage by partial

PLATE 82

PLATE 82

YELLOW WARBLER
Page 230

Adult Male

Young Female

CAPE MAY WARBLER
Page 228

Adult Male

BLACK-THROATED BLUE WARBLER
Page 233

Adult Male

Young Female

Female in Autumn

MYRTLE WARBLER
Page 237

Adult Male in Spring

AUDUBON'S WARBLER
Page 241

Female in Spring

Adult Male in Spring

Allan Brooks

prenuptial molt, involving much body plumage; adult winter plumage by complete postnuptial molt (July). Adults have two molts, postnuptial, complete, and prenuptial (March) as in young.

Field Marks. — Size, near that of Chipping Sparrow. *Adult male:* The only New England warbler with *chestnut cheeks, and sides of neck bright yellow;* has much white on wing like Blackburnian or male Magnolia Warbler, and is yellow below, streaked black, with yellow rump like the latter, and black or blackish cap. *Female and young:* May be recognized by general resemblance to adult male in markings below, but duller in color, yellowish or whitish where adult male is yellow, streaking of breast fainter, without black cap or chestnut cheeks, and with two narrow yellowish-white wing-bars which in some cases are worn off; all sexes and ages have more or less white in tail.

Voice. — Usually silent in migration; occasionally a faint *chip;* song, faint and listless, a monotonous *zee zee zee zee,* sometimes only three *zees,* in an unhurried monotone (Bradford Torrey); suggests some notes of the Black and White Warbler; another song, *a-wit-a-wit-a-wit-a-wit-a-wit-a-wit,* without inflection (A. W. Butler).

Breeding. — In northern coniferous forests and in more open land among small trees. *Nest:* In bush or coniferous tree, from 2 to 40 feet up, usually near top, composed of moss, fine twigs, stems, grass and other vegetal fiber, bound with spiders' webs and lined with hair, fur and feathers. *Eggs:* 3 or 4; .56 to .70 by .47 to .55 in.; ovate or rounded ovate; grayish-white or greenish-white, variously spotted over most of the surface with small spots and dots of yellowish-brown, reddish-brown and lilac, and larger markings showing a tendency to group around large end; figured by E. A. Capen in "Oölogy of New England," Plate IV, Fig. 15, and by F. M. Chapman in "The Warblers of North America," Figs. 35, 36. *Dates:* About June 6 to 16, New Brunswick. *Incubation:* By female. Probably but one brood yearly.

Range. — Eastern and central North America from southern borders of Hudsonian Zone to the West Indies. Breeds in Canadian Zone from southern Mackenzie, southern Manitoba, northern Ontario, northern New Brunswick, Prince Edward Island and the Magdalen Islands south to southern Manitoba, northern Wisconsin, central Vermont, northern New Hampshire, Maine, southern New Brunswick and Nova Scotia, also in the Island of Jamaica (West Indies); winters from southern Florida and the Bahama Islands south through the West Indies to Tobago; casual in migration west to North Dakota, Nebraska and Louisiana; accidental in Yucatan and Honduras.

Distribution in New England. — Rare migrant, becoming not uncommon in some recent years; summer resident in northern parts of Maine and in New Hampshire north of White Mountains; has been seen feeding young in Vermont.

Season in Massachusetts. — May 2 to June 2; September 16 to October 3 (November 20, December 5, 8).

Haunts and Habits. In the years of my boyhood the brilliant Cape May Warbler was so rare that it was considered a lucky day if one were seen, and a real red-letter day when a specimen was taken. In the spring of 1873, if my memory serves me, I met the first bright male of this species that my eyes had rested upon, and that bird, nicely mounted, is before me now. For nearly one hundred years at least this species had been considered very rare in New England, but about 1909 it seemed to become more common. In May, 1912, at Amesbury, Massachusetts, one chilly morning I found bright males scattered through the village. A cold wave, catching them in night migration, had brought them down, and they could be seen here and there on or near the ground, and in low bushes by the roadside. In the dooryards and along the streets these lovely birds hopped and fluttered fearlessly in their search for food, paying little attention to passers-by. By 1915 they had appeared more generally, and in May, 1917, they were well dis-

tributed over a large part of New England. Since that time Cape May Warblers have been not uncommon transients in certain years, and they have never been so rare as they formerly were. In migration they may be found in trees and shrubbery about dwellings and along village streets almost as commonly as in woods or in swampy thickets, where at this season they find many insects. Occasionally a few may be seen in blossoming orchards. They appear more rare in autumn because they are more seldom observed as they pass through southern New England while the trees are fully clothed with leaves, and they are likely to keep concealed more or less in the tree-tops. They also frequent dense thickets and brier-patches, and at that season in their dull fall plumage are seldom noticed. They are not extremely active but are very diligent in the pursuit of insects.

Little is known about the mating or nesting habits of this warbler, and its food has not been carefully studied. We know now that it often nests near the ground in coniferous trees, but there are indications that it may also nest much higher at times. It seems to prefer for this purpose rather open lands with scattering small trees, yet it undoubtedly nests also in northern forests.

The food of this warbler consists largely of insects, among them many beetles and ants. Such destructive beetles as flea-beetles, click beetles and weevils commonly are eaten, also caterpillars and other destructive larvæ.

Economic Status. This species is believed to be generally beneficial to trees and shrubbery, yet like the Tennessee Warbler, the bird has a habit of entering vineyards in autumn and pecking the grapes to extract the juice. Nevertheless, what is said of the Tennessee Warbler as a benefit to vineyards is true also of the Cape May Warbler (see *Economic Status* of the Tennessee Warbler, page 225).

Dendroica æstiva æstiva (Gmelin). Yellow Warbler.

Other names: yellow-bird; summer yellow-bird; wild canary.

Plate 82.

Description. — Form slender, much like that of the Cape May Warbler. *Adult male in breeding plumage:* Above chiefly yellowish-olive-green and olive-yellow; forehead and fore part of crown usually yellow, crown sometimes tinged with reddish-brown; flight-feathers dark edged with yellow, and inner webs of dark tail-feathers mostly yellow, tipped with dusky; sides of head and lower plumage rich yellow; upper breast, sides, flanks (and often throat and breast) streaked with chestnut or orange-brown; wing linings yellow; "iris bluish-black; bill dark blue, upper mandible nearly black; legs, feet and claws light yellowish-brown" (N. S. Goss); "iris olive-brown; bill, upper mandible blackish-slate, lower greenish-blue-slate (except tip); tarsi cinnamon-buff" (F. B. White). *Adult male in winter plumage:* Similar to adult male in breeding plumage, but crown not so bright, and breast much less streaked. *Young male in first winter plumage:* Very similar to adult female in winter plumage and hardly distinguishable. *Adult female in breeding plumage:* Similar to adult male, but duller, somewhat darker and more greenish above, and paler yellow below, with few or no chestnut streaks. *Adult female in winter plumage:* Similar to adult female in spring, but duller in color; pale dirty yellow below without definite streaks; "iris brown; bill bluish-black; legs and feet brown" (J. W. Atkins). *Young female in first winter*

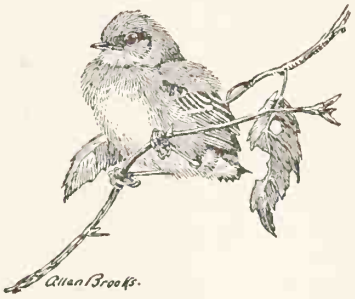
plumage: Similar to adult female in winter plumage, but less yellow above; below pale dusky-yellow, unstreaked, and yellow of tail duller and more restricted. *Young in juvenal plumage:* Above rather pale olive-brown, wings clove-brown, feathers edged outwardly with olive-yellow; below dull, unstreaked yellow.

Measurements. — Length 4.75 to 5.25 in.; spread 7.12 to 8.00; folded wing 2.30 to 2.75; tail 1.70 to 2.25; bill .45 to .52; tarsus .64 to .77. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (July) involving body plumage and wing-coverts; first nuptial plumage by prenuptial molt (April) involving most of body plumage, wing-coverts and tertials, and adult winter plumage by complete postnuptial molt (July); adults molt twice a year, a partial prenuptial molt while in the south, and complete postnuptial molt (July), as in the young.

Field Marks. — Size, near that of Chipping Sparrow but more slender. *Adult male:* The only New England warbler that is chiefly yellow, streaked with chestnut or reddish-brown below. *Female and young:* Similar, but darker above, paler and unstreaked or little streaked, below.

Voice. — Alarm note a rather loud *chip;* song *wée-chc, chee, chee, chée-wee* (R. Hoffmann); *sweet sweet sweet sweet sweetcr sweetcr,* or *sweet sweet sweet sweetie;* again *wee-chee, wee-chee, wee-i-u;* also *wee-chee, chee, chee, chur-wee* (Lynds Jones); a common short song, *weé-chee weé-chee weé.*



Yellow Warbler, Juvenile.

Breeding. — Chiefly about farm lands, orchards, roadsides and along the shores of streams and lakes. *Nest:* In bush, sapling, brier-patch or tree, usually from 3 to 8 feet up, but sometimes 30 to 40 feet; a compact, well-made structure of silver-gray plant fibers, fine grasses, shreds of bark and plant-down, usually lined with plant-down and fine grasses, more rarely with feathers or hair, and securely placed on a fork or crotch. *Eggs:* 3 to 5, rarely 6; .60 to .75 by .48 to .53 in.; short to long ovate; grayish-white or greenish-white to green, marked with various browns, blackish, purple or purplish and lilac-gray, in varying shades, with a tendency to form wreath around large end, but many densely spotted all over; figured by E. A. Capen in "Oölogy of New England," Plate III, Figs. 11–14, and by F. M. Chapman in "The Warblers of North America," Figs. 39–41. *Dates:* May 14 to June 10, Pennsylvania; May 20 to June 30, Connecticut; May 29 to June 30, Maine. *Incubation:* Period 9 to 15 days, usually 10; by female. One brood yearly; said to raise two in some cases. Mr. H. L. Taylor, of Jamestown, Rhode Island, reported a brood of five which hatched August 5, 1925, a very late brood.

Range. — Greater part of both American continents. Breeds east of Alaska and Rocky Mountains, from Hudsonian Zone south to Lower Austral Zone from tree limit in northern Mackenzie, northern Manitoba, northern Ontario and central Quebec (southern Ungava) south to south-central and south-eastern Texas, southern Louisiana, central Alabama and central South Carolina; winters from south-eastern Mexico to Venezuela, French Guiana, northern Brazil and central Peru; casual or accidental in Grenada Island (West Indies), Island of Trinidad and Bermuda Islands. In western United States its place is taken by other races of the species.

Distribution in New England. — Common migrant and summer resident, becoming less common and more local in extreme northern parts, and high altitudes.

Season in Massachusetts. — April 20 to September 30.

Haunts and Habits. The Yellow Warbler usually comes to us with the apple blossoms. Its coloring is so rich that neither artist nor lithographer can do it full justice, and its song is louder and more melodious than that of many among the warbler tribe. It is a bright and happy creature of the sunshine, shunning deep woodland shades but

frequenting gardens and orchards and the trees and shrubbery about open spaces, water courses and bodies of water; it favors brush-grown fences, hedgerows, roadside thickets and open brushy swamps. Habitually it keeps to shrubbery, low trees and the lower parts of larger trees and is rather seldom seen in tall tree-tops. It seems particularly fond of willows and alders that grow near the water, but it nests often in orchards and fruit gardens and in village shade trees.

The name "Wild Canary" often given to this bird is a misnomer, for although it is little and yellow, it is not, like the Canary-bird, a member of the sparrow family. The name may be applied to our other yellow bird, the Goldfinch, with more propriety.

The male bird is a persistent singer, singing every minute or two throughout most of the day. Mr. Neil F. Posson credits him with *3,240 songs* a day or 22,680 a week.[1] He is particularly vociferous while paying court to the female and while she is building the nest, a labor in which he sometimes joins his mate. In many cases, however, he seems to leave the nest-building chiefly or wholly to her. In building their nests most warblers use the bill, throat, wings and tail to smooth down the edges, meanwhile sitting in the nest and turning around from side to side arranging the lining behind with the feet and smoothing it in front with the breast, thus utilizing all their members in building, smoothing and shaping the nest. Mr. Paul Morris, who watched a female Yellow Warbler building her nest, says that she commenced by weaving a small ring about two inches in diameter out of coarse gray fibers of the milkweed, by way of foundation, and then built up the nest by taking fine fibers in her bill and weaving them into the foundation, meanwhile turning around and around and pushing and felting it together. Mr. F. H. Mosher also watched a female building her nest. He says: "She first laid a foundation of a few straws and placed upon them the cotton or down from fern fronds. These she bound together with the silk from a tent caterpillar's web. Then she went alternately for the cotton and the silk, stopping occasionally at an apple tree and feeding for a moment or two on canker-worms. When I went past the nest at night I found she had it nearly complete; the lining only was lacking." [2] Sometimes the nest building occupies a week or more.

The Yellow Warbler often is victimized by the Cowbird, and is likely then to build another nest on top of the first, thus burying the Cowbird's egg. This manner of disposing of the Cowbird's egg may be repeated until four or even five nests are built, and Dr. H. F. Perkins tells of one case where a six-storied nest was built, with a Cowbird's egg in every one. The young usually remain in the nest from 11 to 15 days. Their juvenal plumage, like that of nearly all our warblers, is worn but a short time and by the middle of July most of them have donned their winter dress.

Mrs. C. E. Norton, of Lewiston, Maine, tells of a friend who found an unfledged youngster that had fallen from a nest. She did not know where it belonged, so she put it in a cage on her veranda, to save it from the cats, and there the male parent came and fed it for a week. The female also appeared and seemed greatly excited, but never

[1] Oölogist, Vol. IX, 1892, p. 65. [2] Forbush, E. H.: Useful Birds and Their Protection, 1907, p. 195.

brought any food. When the young bird was fledged it was liberated, and then both parents came and enticed it away. Thus, finally, in a low tree at some distance, the little family was happily reunited.

The Yellow Warbler is rather a tender bird and starts south very early. By the middle of July some individuals, probably from the southern part of their range, begin to cross the Gulf of Mexico, and by the 15th of August most of the local breeding birds of this species have left New England. Stragglers are still going in early September, and by the latter part of the month all have disappeared.

Economic Status. "It would be hard to find a summer bird more useful among the shade trees or in the orchard and small-fruit garden than this species. Almost entirely insectivorous, it feeds on many of the greatest pests that attack our fruit trees, vines and berry bushes. Whenever the caterpillars of which it is fond are plentiful, they form about two-thirds of its food. It is destructive to the small caterpillars of the gipsy moth and the brown-tail moth, and is inordinately fond of canker-worms and other measuring-worms. Tent caterpillars are commonly eaten. Small bark-beetles and boring beetles are eaten, among them the imago of the currant-borer. Weevils are greedily taken. A few useful beetles are sacrificed; among them ground-beetles, soldier beetles and small scavenger-beetles. The Yellow Warbler has some expertness as a flycatcher among the branches, and seizes small moths, like the codling-moth, with ease, but apparently does not take many parasitic hymenoptera, though some flies are taken. Plant-lice sometimes form a considerable portion of its food. No part of the tree where it can find insect food is exempt from its visits, and it even takes grasshoppers, spiders, and myriapods from the ground, grass, or low-growing herbage." [1] It attacks none of the products of man's industry, so far as our records go, except the raspberry, of which it has been known to eat a few occasionally.

Dendroica cærulescens cærulescens (Gmelin). Black-throated Blue Warbler.

Plate 82.

Description. — Form much like other members of the genus; bill rather slender; tail nearly even or slightly rounded. *Adult male in breeding plumage:* Above chiefly rather dark grayish-blue, with some black occasionally on back and more rarely on inner tail-coverts; wings dark brown or blackish, edged dark bluish on outer webs; primaries (except outer) white basally and on inner edges, forming a conspicuous white spot in fore wing beyond ends of primary-coverts; inner webs of secondaries margined white, which extends basally to shafts, much as in primaries, but no white shows on secondaries in closed wing; tail black or blackish, edged bluish, two or three outer tail-feathers on each side with large white patches toward ends of inner webs; chin, throat, upper breast, sides and flanks, sides of head and a narrow line across forehead at base of bill black; elsewhere below, including wing linings, mostly white; bill black; iris brown; legs and feet black or blackish. *Adult male in winter plumage:* Same as breeding plumage, but black below may be rather less in extent. *Young male in first breeding plumage:* Similar to adult male in breeding plumage, or nearly indistinguishable, but usually shows remains of greenish

[1] Forbush, E. H.: Useful Birds and Their Protection, 1907, pp. 195, 196.

edgings on back and on flight-feathers, and tail browner and more worn. *Young male in first winter plumage:* Bluish-leaden-gray above, not so blue as in adult male, bluest on head, and more or less veiled above by olive-green feather-margins; black below veiled with whitish or ashy tips, and white posterior lower plumage tinged yellowish; wings browner than in adult male, not so black. *Young male in juvenal plumage:* Above, olive-brown; wings blackish, primaries edged bluish-leaden-gray; wing-coverts, secondaries and tertials margined olive-green; a white spot or patch on wing as in adult male; tail much as in adult male; below brownish, tinged yellowish on throat and abdomen; dusky patch in front of eye, light stripe over it, and two streaks of same on lower jaw. *Adult female in breeding plumage:* Above olive or olive-green, with a slight variable bluish tinge, most evident on top of head and on upper tail-coverts; *a small dingy-white spot on wing,* placed as in adult male, but sometimes concealed; a whitish streak over eye (including eyelids), and dark patch before and below it, widening over ear-coverts into an inconspicuous dark patch, lower eyelid partly white; tail darker and more grayish than back, with feather-edges "light bluish or greenish-gray," inner web of outer feather on each side sometimes has a pale spot; below pale olive-yellowish, becoming more olive on sides and flanks; wing linings whitish; bill blackish; iris brown; legs blackish. *Adult female in winter plumage:* Similar to adult female in breeding plumage, but slightly brighter and more greenish above and more yellowish below. *Young female in first winter plumage:* Similar to adult female in winter plumage, but greener and without bluish tinge above, and more buffy or yellowish below; light streak over eye yellowish. *Young female in juvenal plumage:* Similar to young male in same plumage, but wings and tail browner with greenish instead of bluish edgings to primaries and tail-feathers; white wing-spot dingier and sometimes concealed.

Measurements. — Length 4.82 to 5.50 in.; spread 7.12 to 7.88; folded wing 2.19 to 2.65; tail 1.75 to 2.25; bill .40 to .50; tarsus .64 to .73. Female smaller than male.

Molts. — Juvenal plumage produced by complete postnatal molt; first winter plumage by partial postjuvenal molt (July, August) involving body plumage and wing-coverts, sometimes one or more tertials are acquired; first breeding plumage by limited molt about head, and adult winter plumage by complete postnuptial molt (July, August); adults may have a limited prenuptial head molt as in young, and a complete postnuptial molt (July, August).

Field Marks. — Size near Chipping Sparrow, but more slim. *Adult male:* Unmistakable; slaty-blue above, without wing-bars, but a *conspicuous white spot on wing;* throat and sides black, breast and belly white. *Immature male:* Similar to adult male, but not so blue above, the blue veiled with greenish and the black with whitish tips. *Female and young:* Quite different and obscure; greenish or brownish-olive above with a *small whitish spot on wing* as in male, but much smaller (sometimes concealed), and a whitish or yellowish streak over eye; yellowish or buffy below; adult female more bluish or grayish above than young.

Voice. — Alarm note a rather heavy *chuck;* common song three rather pure notes with downward inflection and a fourth with rising inflection *"whee-a whee-a whee-a whee-ee"* (R. Hoffmann); *twe-twea twee-e e a* (John Burroughs); but many variations as *zwee zwee zwee,* an explosive *swee-chirrrr′,* second half more emphatic and a little lower in key; also *wheer, wheer, wheeee,* the last note louder and higher pitched, and a string of short hurried notes like *hi-hi-hi-hi-hi-hi-hi;* all these songs more or less husky or beady; a peculiar call-note of male, a weak insect-like *bz z z bz z z bz z z bz z z* several times repeated (G. H. Thayer).

Breeding. — Usually in or near deep woods, in edges of woodland clearings, in moist places or near water. *Nest:* In either coniferous or deciduous trees, or bush, from 3 to 10 feet from ground; rather bulky outside, but neatly lined within; composed of twigs, vines, bark-strips, rootlets, grasses, spiders' webs and rootlets, lined with fine black rootlets or horsehair. *Eggs:* 4 or 5; .61 to .69 by .47 to .50 in.; rounded ovate; grayish-white, greenish or buffy-white, spotted and blotched with various shades of brown, lilac and lavender, sometimes gathered around large end; figured by E. A. Capen in "Oölogy of New England," Plate IV, Fig. 1, and by F. M. Chapman in "The Warblers of North America," Figs. 45–47. *Dates:* May 14 to June 10, Pennsylvania; May 20 to June 30, Connecticut; May 23 to June 10, Massachusetts; June 5 to July 15, eastern Canada. *Incubation:* Period unknown; by female.

RANGE. — Eastern North America west to the edge of the Great Plains and eastern Central America. Breeds in Canadian and Transition zones from north-central Minnesota, south-central Ontario and southern Quebec south to central Minnesota, southern Michigan, southern Ontario, southern Pennsylvania and southern Connecticut; winters from Florida Keys to Bahamas, Greater Antilles (Cuba, Isle of Pines, Jamaica, Haiti and Porto Rico), Little Cayman, Cozumel Island (Yucatan), Swan Island (Honduras), casually to Guatemala, Colombia, and Peru; casual in migration also in North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Colorado and New Mexico; accidental in Farallon Islands (California).

DISTRIBUTION IN NEW ENGLAND. — *Maine:* Common migrant; less common summer resident. *New Hampshire:* Common migrant; less common summer resident at elevations up to about 2,500 feet. *Vermont:* Common migrant; not uncommon summer resident locally in deciduous woods up to about 2,500 feet. *Massachusetts:* Common migrant; common to uncommon summer resident on higher lands of western part and east to Worcester County, casual or absent elsewhere in summer. *Rhode Island:* Uncommon migrant. *Connecticut:* Common migrant; rare summer resident, breeding chiefly in western part.

SEASON IN MASSACHUSETTS. — (April) May 2 to June 3 (summer), August 26 to October 16.

HAUNTS AND HABITS. This is a real wood warbler. It loves the woods. "Its typical haunts," says Herbert K. Job, "are the densely shaded second-growth on the sides of wooded hills, either well to the north, or else to the corresponding faunal altitude. To suit its fastidious taste there should be rather dense undergrowth, with more or less fallen branches, and more particularly where mountain laurel luxuriates. It might well have been named the 'Laurel Warbler.'" [1] In southern New England it often nests in laurel thickets, but in northern New England, according to Brewster, the yew is its favorite.

The male of the Black-throated Blue Warbler may be recognized at once, for his name describes him. The female, however, is an obscure, inconspicuous bird, though she may be recognized if the small white patch in her lower mid-wing can be seen, for its situation is the same as in the male. They arrive in New England from the south by the middle of May, if not before, and frequent deciduous or mixed woods, though in migration they often visit farms, orchards and even villages, but they breed in or near the woods. Often the males are seen high in the trees where they are active, though less so than those of the Redstart. Like the latter they catch many insects on the wing. Their colors are striking rather than bright, and their peculiar buzzing songs guide the observer to them. Mr. Aretas A. Saunders tells me that he heard from one of these birds a clear whistled note like a chickadee's whistle reversed, the second note higher than the first — a good example of a freak song.

This warbler breeds much more generally in New England than the records indicate, nesting south even to the coast of Connecticut, but in Rhode Island and southeastern Massachusetts I know of no breeding record. For breeding purposes it seems to prefer woodland clearings, hill pastures with young spruces, hemlocks and deciduous shrubbery, wooded ridges where the lumbermen have taken out the larger deciduous trees, or the

[1] Nature Lovers Library, Birds of America, T. G. Pearson, Editor, Vol. III, 1917, pp. 127, 128.

bushy edges of woodlands. It is fond of mountain laurel thickets and second-growth of beeches and maples. It often nests near streams, or wood roads, preferring small openings to dense timber.

When a nest is discovered the female may fluff out the feathers of her sides so as to cover the whole top of the nest in an apparent effort to conceal it and her young. Mr. J. A. Farley gives me the following notes on this habit: "A female *Dendroica cærulescens* (Black-throated Blue Warbler) whose nest I found June 19, 1918, in Rowe, Massachusetts, made a unique display of herself as a close-sitting bird. The nest, a beautiful and elaborate structure, was three feet from the ground in a hemlock sapling, which was one of a thick clump of the same sort that bordered a wood road. The eyes of the young were open. The female was off the nest when I found it. But when I returned, a quarter of an hour later, she was on. I got within two feet of her, but she would not fly. To get nearer seemed like adding 'insult to injury,' so I did not try to stroke her back, as I have done before with a brooding bird. But it was not her bravery that made this close-sitting bird unique, it was the unusual way in which she protected her young from my gaze. She had spread the white feathers of her lower parts out so completely over her young that there was not a vestige now visible of the four young birds that I had found a short time previously filling the nest so full. She 'fluffed' herself out so as to hide all traces of the young. For a moment I even thought that during my absence of a few minutes she had brought a great deal of some soft stuff as additional lining for the nest, as breeding birds sometimes do. To quote from my journal: 'She made a beautiful picture. The whole effect was wonderful. The bird seemed to be sitting in a billowy mass of eider down, or cotton wool, that swelled, or rather bulged, up all around her, a regular bed of down.' This *cærulescens* was a remarkably fearless bird. Two days later I went to the nest again. The young had flown, but were close by. It was nearly dusk in the woods. The female 'chipping' and with 'shivering' wings came very close, almost as close as she could get without touching me." [1]

Some females when startled from the nest attempt by every artifice to draw the intruder away; others seem to be exceedingly shy and conceal themselves as if more fearful for their own safety than for that of their young. When the female utters her alarm note, the male may appear or he may not; usually if he comes he seems not greatly perturbed.

When the young leave the nest they soon shed their juvenal plumage and molt into their winter dress, and as August wanes they are ready for their southward migration. Most members of this species leave New England during September. The Black-throated Blue Warbler, like others of its family, feeds largely on moths, caterpillars, including the hairy tent caterpillar, flies, beetles and plant-lice, but its food has never been thoroughly investigated.

Economic Status. See page 197.

[1] Farley, J. A.: *in litt.*

Dendroica coronâta coronata (Linnæus). Myrtle Warbler.

Other names: YELLOW-RUMPED WARBLER; MYRTLE-BIRD; YELLOW-RUMP.

Plate 82.

Description. — Form similar to other warblers of the genus; bill slightly notched near tip of upper mandible; tail nearly even. *Adult male in breeding plumage:* Above bluish-slate-gray, streaked black, upper tail-coverts black, edged gray; *a patch on top of head, one on lower rump, another on each side of breast bright yellow;* wings and tail black or brownish-black, with gray edgings; two white wing-bars; tail with white patches or large spots on *three* outer tail-feathers on each side, decreasing in size from outer inward; streak over eye and part of each eyelid white; large black patch extending from base of bill to under and behind eye, widening over ear-coverts; below chiefly white including wing linings; a black patch usually marked with white on lower throat and upper breast, extending backward on each side past yellow of sides to flanks, where broken into black streaks; iris brown; bill and feet black or blackish. *Adult male in winter plumage:* Unlike same in breeding plumage, grayish-brown above with streaks of black on back; *yellow on head more or less concealed by brown tips,* but that on rump evident; sides of head marked much as in spring, but not so bright, brown taking the place of black; wing-bars buffy; black on sides of breast washed with brownish, and broken and veiled somewhat by white edges, and yellow spots on sides smaller. *Young male in first winter plumage:* Similar to adult male in winter, but not so bright; wings and tail not so black, the edgings not so bright gray; yellow of head sometimes entirely concealed by brownish. *Adult female in breeding plumage:* Similar to adult male in winter plumage, but black streaks more sharply defined; wing-bars white, and cheek patches blacker. *Adult female in winter plumage:* Similar to young male in winter, but averages browner and less streaked. *Young female in first winter plumage:* Similar to adult female in winter or young male in first winter, and not often distinguishable, but yellow patches average smaller and those on sides sometimes wanting. *Young in juvenal plumage:* Above brown, streaked black with many buffy feather-edges; wings and tail dull black, edged drab; two wing-bars buffy or whitish; both eyelids show some white; below *pale yellow to whitish, distinctly streaked with black over all;* "bill and feet dusky-pinkish-buff, the former becoming black, the latter deep sepia" (J. Dwight).

Myrtle Warbler, Juvenile.

Measurements. — Length 5.00 to 6.00 in.; spread 8.00 to 9.40; folded wing 2.58 to 3.20; tail 2.00 to 2.77; bill .43 to .50; tarsus .62 to .74. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by post-juvenal molt (August, September) involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (March to early May) involving body plumage, wing-coverts and sometimes a tertial (this molt somewhat restricted in female); adult winter plumage by complete postnuptial molt (late July, August); adults acquire breeding plumage by partial molt (March, April) as in young birds, this molt being somewhat restricted in the female (as in most birds), and adult winter plumage by complete postnuptial molt (late July to September).

Field Marks. — Size a little larger than Chipping Sparrow. Adult male in spring a bluish-gray bird, streaked with black; white below with *much black* on breast and sides; *four bright yellow patches,* one on top of head, one on rump and one on each side; two white wing-bars; white spots showing in spread tail. Adult female in spring a brownish bird with yellow markings placed as in male, but duller and with less black; wing-bars less prominent. Adults and young in autumn and winter similar to adult female in spring, but browner, showing less black and less yellow; all, however, have a white or whitish stripe

over eye, *a distinct white or whitish throat*, two white wing-bars and a yellow patch on rump. Magnolia and (usually) Cape May Warblers also have a yellow rump, but are yellow below where the Myrtle Warbler is mainly white or whitish with dark streaks.

Voice. — Call notes a *peep* or *sweet*, uttered in flight, with rising inflection, and used much in autumn and winter; a loud *check* or *chuck;* a low-pitched call *tsup*, almost exactly resembling the plash of a large drop of water on the wet forest floor, or on the ground; song a "loud and silvery 'sleigh-bell' trill — a vivid sprightly utterance, often more or less broken up into separate notes, particularly in its *diminuendo* termination" (G. H. Thayer); somewhat like the song of the Slate-colored Junco, but not so full or so well sustained; also it has other songs, and sometimes in October a very soft low warble; its song "generally consists of two sets of phrases, composed of the syllables *wee-see-seé-see*, the second sometimes in a lower, sometimes in a higher key than the first, but neither of them at all sharp or decided" (R. Hoffmann); "didididi" (Mrs. E. O. Marshall).

Breeding. — In coniferous woods or in young coniferous growth near the edges of woods, sometimes in mixed woods. *Nest:* Usually in a small coniferous tree, hemlock, spruce or pine, but sometimes 30 to 40 feet up; rather bulky for a warbler, built of stems, twigs, fine bark-strips, dried grass, weeds, stalks, etc., bound with spiders' webs and lined with hair and feathers or plant-down. *Eggs:* 3 to 5, very rarely 6; .64 to .80 by .50 to .55 in.; long ovate to short rounded ovate; very variable in shape, color and markings; dull white to creamy-white, spotted with brown and purple of various shades, and also pale lavender and sometimes with blackish, often disposed in a ring around large end; figured by E. A. Capen in "Oölogy of New England," Plate IV, Figs. 2–4, and by F. M. Chapman in "The Warblers of North America," Figs. 48, 49. *Dates:* May 23 to June 5, Massachusetts; May 31 to June 9, New Hampshire; May 30 to June 11, Maine; May 29 to June 16, Ontario. *Incubation:* Period between 12 and 13 days (O. W. Knight); chiefly by female. One brood yearly.

Range. — North America (except western United States and western Canada) and Central America. Breeds in Hudsonian and Canadian zones from near tree limit in northern Manitoba, northern Ontario, southern Ungava (central Quebec) and central Labrador south to northern Minnesota, north-central Michigan, southeastern Ontario, central New York and central Massachusetts; winters from Kansas, central Missouri, southern Indiana, northwestern Pennsylvania, southeastern New York and southern Maine south to southern Vera Cruz, southern Oaxaca, the Greater Antilles, Bahama Islands, Bermuda Islands and Panama; accidental in Greenland and Lower California.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common migrant and summer resident; most common in summer in higher lands or northern parts; uncommon, local, rare or absent in summer in low and coastal lands in southern parts; winters casually in coastal regions of extreme southern Maine and probably also in similar regions in New Hampshire. *Massachusetts:* Common migrant; uncommon to rare and local summer resident, chiefly on higher lands in western counties, and east to eastern Worcester County; casual summer resident in eastern counties south to Plymouth County; common local winter resident in coastal regions and rare in winter west at least to central Worcester County. *Rhode Island and Connecticut:* Common migrant; much less common winter resident; summers and possibly breeds locally in the hills of northwestern Connecticut.

Season in Massachusetts. — April 8 to May 30 (summer), August 21 to November 26 (winter).

Haunts and Habits. This gentle warbler is an early migrant. In March and April there is a great flight of Myrtle Warblers up the Atlantic coast of the United States, following the coastal belt of waxmyrtle and bayberries. Their average arrival at Prince Edward Island is April 26, thirteen days ahead of eleven other species of warblers, and nearly a week earlier than at certain interior stations of Pennsylvania, six hundred miles to the southwest.[1] This early migration is possible along the coast, as in the

[1] Whittle, C. L.: Auk, Vol. XXXIX, 1922, p. 29.

case of the Tree Swallows, largely because of the food supply furnished them by the bayberry which grows chiefly in the coastal region, as far north as Prince Edward Island.

In the latter days of April or very early in May when the south wind blows, when houstonias and violets begin to bloom on sunny southern slopes, when the wild cherry and apple trees and some of the birches, sumacs and the shrubbery in sheltered sunny nooks begin to put out a misty greenery of tiny leaflets, then we may look for the Myrtle Warblers, the males lovely in their nuptial dress of blue-gray, black, white and lemon-yellow. Then they may be found fluttering about in sheltered bushy bogs, catching the early insects that dance in the sunshine along the water-side. All through early May they move northward, or westward toward the mountains, migrating by day or night indifferently as the case may be.

As summer approaches the males begin their courtship of the females, following them about and displaying their beauties by fluffing out the feathers of their sides, raising their wings and erecting the feathers of the crown, so as to exhibit to the full their beautiful black and yellow markings. After much time spent in courting they mate, and at once look about for a nesting place.

Although this bird breeds chiefly in the Canadian faunal area, many nest on the highlands of western Massachusetts, and rarely a pair may be found breeding in white pines at no great height above sea level east to central Worcester County and south almost to the southern boundary of the state. Mr. J. A. Farley once found a nest in Webster, Massachusetts, and, strange to tell, it was situated not far from the end of a long branch near the top of a tall white pine in a cow pasture. Mr. Farley watched the female building the nest and later I climbed the tree and saw the eggs. Messrs. Joseph Hagar and John D. Smith saw one feeding fledglings at Marshfield Hills almost within sound of the surf and very near sea level. This was observed on July 14, 15 and 18. On June 14, 1921, Mr. L. E. Pratt, of East Carver, in Plymouth County, adjacent to Plymouth, found a nest of the Myrtle Warbler there with young in it. This nest was in a white pine and about twenty-five feet from the ground.

The nest building usually is the work of the female, though in some cases the male helps a little, bringing some material, and usually encourages her by his companionship and song. The nest building may occupy six to ten days, according to Professor O. W. Knight. Incubation ordinarily begins when the first egg is deposited, and some males "assist their mates briefly in this task." The young remain in the nest about two weeks. As in all our wood warblers, the juvenal dress is worn for a brief period only, and by early August the young birds have acquired their first winter plumage.

The Myrtle Warbler is a hardy bird. Like other warblers it delights to bathe and does so not only in the hot weather of midsummer but also in spring and autumn. Miss Agnes M. Learned says that in late September she watched one taking a bath in wet grass, each blade of which was edged with shining drops — a pretty sight.

In September and early October, when all our forested hills are red and golden, our

Myrtle Warblers come back to us again. Then they may be found where plant-lice swarm upon the birches in sheltered situations, where they feed diligently until the insects are gone, when they take wing again and wend their southward way, clothed now in modest vesture, each little bird retaining, however, a yellow spot just above the upper tail-coverts, by which, whenever his wings are spread or lowered, he discovers his identity to those who know his secret. From this mark the bird was known for many years as the Yellow-rumped Warbler, until a committee of the American Ornithologists' Union named him the Myrtle Warbler.

Even before the first of September some of the birds have begun to move southward or toward the coast, where many remain all winter or until the bayberry crop is exhausted, when they must move on or starve. Thus they disappear in late winter from many localities where they were common earlier in the season. Now that thousands of Starlings remain on our sea-coast in mild winters, these interlopers devour the bayberries earlier in the season than would be the case were the berries left to the native birds alone; and we may expect the wintering Myrtle Warblers gradually to disappear from our coastal regions if the Starlings continue to increase at their present rate. Rarely a few of the former may be seen in winter as far west as the Connecticut Valley, but the vast majority pass on into the south.

The Myrtle Warbler is one of the few warblers that can subsist for long periods upon berries and seeds, although undoubtedly it prefers insects when it can get them. Along the coast during the milder winters there are many flies rising from the seaweed in sheltered spots on mild days even in January, and there are eggs of plant-lice and some hibernating insects to be found on the trees, but the principal food of the Myrtle Warbler in New England during the inclement season is the bayberry. They can exist, however, on the berries of the Virginia juniper or red cedar and these seem to form their principal food when wintering in the interior; berries of the Virginia creeper or woodbine, those of viburnums, honeysuckle, mountain ash, poison ivy, spikenard and dogwoods also serve to eke out the birds' bill of fare. In the maple sugar orchards in early spring they occasionally drink sweet sap from the trees. In the southern Atlantic states they take palmetto berries. North and south they also eat some seeds, particularly those of the sunflower and goldenrod. During spring and summer they destroy thousands of caterpillars, small grubs and the larvæ of saw-flies and various insects, leaf-beetles, bark-beetles, weevils, wood-borers, ants, scale insects, plant-lice and their eggs, including the woolly apple-tree aphis and the common apple-leaf plant-louse, also grasshoppers and locusts, bugs, house-flies and other flies including caddice-flies, crane-flies, chalcid-flies, ichneumon-flies and gnats, also spiders.

Economic Status. As this warbler visits New England and breeds here in considerable numbers, probably it is one of our most useful birds, as 78 per cent of its food consists of insects, largely injurious.[1]

[1] United States Department of Agriculture, Bureau of Biological Survey, Farmers' Bulletin No. 513, 1913, p. 12.

Dendroica aúduboni auduboni (J. K. Townsend). Audubon's Warbler.

Plate 82.

Description. — One of the largest warblers, resembling the Myrtle Warbler (see page 237), but averaging larger, with similar yellow patches on top of head, sides and rump, but usually lacking the white streak over eye, and sides of head not black but leaden-gray; *has also a yellow throat and chin;* in autumn it becomes chiefly brown, as does the Myrtle Warbler. *Adult male in breeding plumage:* Similar to male of Myrtle Warbler, but ground color above a more bluish-gray; cheeks bluish-gray, *without black;* a *large white patch* on wing-coverts; throat yellow and *four* outer tail-feathers marked with white. *Adult female in breeding plumage:* Two white wing-bars as in Myrtle Warbler; breast ashy, more or less spotted with black; some females show no yellow on throat. *Adults in winter plumage:* Resemble Myrtle Warblers in same plumage, but throats usually yellow or yellowish, and white on tail extends to 4th feather. *Young:* Resemble young of Myrtle Warbler but white extends to 4th tail-feather and the throat is yellowish.

Measurements. — Length 5.12 to 6.00 in.; spread 8.75 to 9.33; folded wing 2.80 to 3.20; tail 2.25 to 2.55; bill .41 to .51; tarsus .68 to .74. Female smaller than male.

Molts. — Similar to those of Myrtle Warbler.

Field Marks. — *Adult male:* Similar to Myrtle Warbler in size with similar yellow patches on top of head, sides of body and rump, but also a *yellow chin and throat* and more white on wings and tail; *gray cheeks* and a *large white patch or double patch on fore wing* in place of two separate wing-bars. *Female:* Similar to female of Myrtle Warbler, and *with two wing-bars;* but throat usually yellow though paler than in male. *Young:* Much like adult female in autumn; throat slightly tinged yellow, or nearly as white as in young of Myrtle Warbler; those with white throat not recognizable in the field.

Voice. — Call note, much like that of Myrtle Warbler but sharper and more incisive. Song, a weak, monotonous, but rather pleasing effort.

Breeding. — In coniferous, deciduous or mixed woodland; in southern parts of its range usually on mountains. *Nest:* In either coniferous or deciduous tree or shrub, from 4 to 60 feet up, on a limb, sometimes near trunk; built of fine twigs or bark-strips, rootlets, moss, weeds, leaves or grass, or all these, lined with hair or fur and feathers. *Eggs:* 3 to 5, usually 4; .69 to .74 by .50 to .55 in.; white, greenish-white, pinkish-white or bluish-white, spotted and blotched with olive-brown, purplish-brown, lilac and lavender, all having a tendency to group round large end, but variable, and sometimes spotted all over with brown; figured by F. M. Chapman, in "The Warblers of North America," Figs. 50, 51. *Dates:* April 22 to June 26, coast of Washington; June 16, Colorado in mountains above 7,600 feet. *Incubation:* By female. One brood yearly.

Range. — Central-southern Canada, western United States, Mexico and Guatemala. Breeds in Canadian and Transition zones from central Alberta and southwestern Saskatchewan south to mountains of southeastern California, southeastern Arizona and central-western Texas and east to central Montana, Black Hills (South Dakota), northwestern Nebraska, central Colorado and central New Mexico; winters from southern California, southern New Mexico, and south-central Texas to southern Mexico and Guatemala; in migration occurs east to Iowa; accidental in Minnesota, Pennsylvania and Massachusetts.

Distribution in New England. — Accidental visitor. Records: *Massachusetts:* Watertown, November 15, 1876, a young male taken by A. M. Frazar;[1] Southampton, May 14, 1920, one reported by Miss Bessie M. Graves.[2] *Connecticut:* There is a record by Verrill of a bird at New Haven, May 6 and 8, 1893, but this is considered so extremely doubtful that it is not even mentioned in the "doubtful" list of Sage, Bishop and Bliss in their "Birds of Connecticut."

Haunts and Habits. Apparently this western warbler frequents regions similar to those visited by the Myrtle Warbler and has similar habits. In fly-catching ability

[1] Bulletin, Nuttall Ornithological Club, Vol. II, 1877, p. 27.

[2] Graves, Miss Bessie M.: *in litt.*

it exceeds the latter and it is even more showy, as the deep black of its breast contrasts strongly with its yellow throat and sides, and it shows more white in wings and tail than does its common congener of the northeast. We have but one undoubted record for New England, and this bird was first recorded by Mr. Frazar, as taken in the neighborhood of Cambridge, but Mr. Brewster informs us that it was shot in Watertown. I have received two recent reports of this species in New England (sight records) which may be authentic, and about ten years ago I saw a bird in autumn which had a yellow tint on its throat, but on examining it with a glass concluded that it would be unsafe to record it as an Audubon's Warbler. As the Myrtle Warbler in autumn may sometimes have a slight yellowish tinge on the throat and as Audubon's Warbler seems to have been actually taken but twice to the eastward of the Mississippi, sight records, especially in autumn, should be distrusted.

According to Professor F. E. L. Beal, the food of this species in California "consisted of nearly 85 per cent of animal matter (insects and spiders) and a little more than 15 per cent of vegetable." [1] This bird eats great numbers of wasps and ants. It also takes many caterpillars and small beetles.

Economic Status. What is known about the food of Audubon's Warbler indicates its usefulness.

Dendroica magnólia (Wilson). **Magnolia Warbler.**

Other names: BLACK AND YELLOW WARBLER.

Plate 83.

Description. — Form slender; bill rather short; tail nearly even or slightly rounded. *Adult male in breeding plumage:* Top of head and back of neck ashy or bluish-gray; narrow line round front of forehead, widening on lores, cheeks and ear-coverts, back, tail-coverts and tail, chiefly black; stripe from above eye to back of head between gray crown and black cheeks, lower eyelid (largely), large patch on middle and greater wing-coverts and broad band on inner webs of tail-feathers, extending squarely across middle of tail (except central pair of feathers), white; wings blackish, edged gray; rump and lower plumage chiefly yellow; breast, sides and flanks broadly streaked black; wing linings white; under tail-coverts and broad band across lower side of tail, white; "bill blackish-slate; iris blackish-violet-gray; tarsi dark neutral gray, toes underneath citrine-drab" (F. B. White); bill black, sometimes pale at base below; iris brown; legs and feet dusky or blackish, "bottom of feet dull greenish-yellow" (N. S. Goss). *Adult male in winter plumage:* Quite different from spring plumage; crown and back of neck more brownish-gray; eye-ring whitish; back olive-green indistinctly streaked or spotted blackish; two white wing-bars; rump and tail as in spring; below yellow with partly concealed black stripes on sides. *Immature male in first breeding plumage:* Usually flight-feathers and tail-feathers browner and more worn than in adult. *Young male in first winter plumage:* Same as adult male in winter, or with streaks on sides less distinct. *Adult female in breeding plumage:* Similar to adult male in same plumage, but top of head less bluish and sides of head not so black; back olive-green spotted with blackish; less white on wing-coverts, and tail-coverts broadly tipped gray; black streaks below narrower and duller. *Adult female in winter plumage:* Resembling adult male in winter plumage but not quite so bright; eye-ring white, but no white stripe behind eye; top of head and back slightly browner; wing-coverts browner and their white markings less

[1] United States Department of Agriculture, Biological Survey, Bulletin No. 30, 1907, p. 44.

PLATE 83

PLATE 83

BAY-BREASTED WARBLER
Page 251

MALE

IMMATURE MALE

CHESTNUT-SIDED WARBLER
Page 248
ADULT MALE

MAGNOLIA WARBLER
Page 242

ADULT MALE

IMMATURE MALE

IMMATURE

CERULEAN WARBLER
Page 246

MALE

FEMALE

Allan Brooks.

pronounced. *Young female in first winter plumage:* Resembling adult female in fall and winter, but top of head and back browner, latter usually not so streaked with black, rump not so clear yellow, and streaks below less prominent than in adult. *Young in juvenal plumage:* Quite different from older birds; brown or reddish-brown above, indistinctly streaked or mottled darker brown; below variable, yellowish or whitish; dusky or grayish on throat and sometimes on breast; more or less streaked or mottled with deep olive-brown; "bill dusky pinkish-buff, black when older; feet pinkish-buff, pale sepia when older" (J. Dwight) (see Fig. 81).

Measurements. — Length 4.35 to 5.10 in.; spread 7.00 to 7.80; folded wing 2.20 to 2.75; tail 1.70 to 2.25; bill .42 to .50; tarsus .64 to .73. Female smaller than male.

Molts. — Practically the same as in Myrtle Warbler (see page 237).

Field Marks. — Smaller and more slender than Chipping Sparrow. *Adult male in spring:* Has bluish-gray top of head, white streak behind eye, black cheeks, *black back, yellow rump,* large white patch on wing-coverts and broad *white band across most of spread tail;* chiefly *bright yellow below,* streaked black on lower throat, upper breast and sides; tail seen from below looks largely white, with very broad black band at tip. *Adult female in spring:* Similar to male, but back olive-green, spotted black, and not so much white in wings. *Adults and young in fall:* Duller, more brown above, but still yellow below very sparsely streaked with black on flanks; rump still yellow and tail much as in spring male, *being chiefly white* with broad black band at end. This distinguishes it at once from the yellow-rumped Myrtle and Cape May Warblers.

Voice. — Alarm note, a sharp ringing *chip;* call, a soft note with a slight metallic ring, sounding as if lisped, *tlep, tlcp,* reminding one of some notes of the Pine Siskin and Henslow's Sparrow (G. H. Thayer); or "*tizic,* resembling the song of the Yellow-bellied Flycatcher" (F. H. Allen); a harsh *de kay kay kay,* like a miniature Blue Jay (S. E. White). Song, quite variable; a common one "suggests the syllables *weely, weely, wichy*" (R. Hoffmann); *wee-ehy, wee-chy, wee-chy,* or *wee-o, we-o, wee-ehy,* or *wee-ehy wee-chy, wee-chy-tee* (Miss C. J. Stanwood); *weeto weeto weeétee-eet* or *witchi, witchi, witehi tit;* or *witti witti wét* or *weetee weetee wûr;* an aberrant song, *ter-whiz wee-it,* another *wcé-yer weé-yer wcé-yer* (G. H. Thayer); *wiehy wichy weé-sy,* another *weechy weechy weeehip* (Mrs. M. M. Nice); about ten other variations have been recorded; quality of tone somewhat similar to that of the Yellow Warbler or Chestnut-sided Warbler.

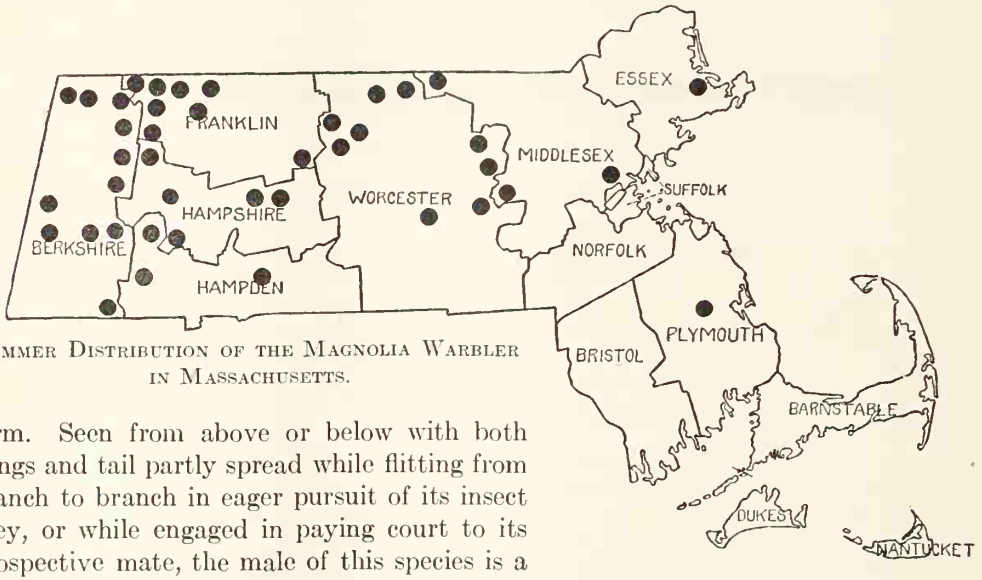
Breeding. — Usually in small groups of spruces or hemlocks, or in small sapling spruces or Virginia junipers, in old fields or pastures, occasionally in the heart of coniferous forest, but commonly near some small opening or beside wood road. *Nest:* Often in young coniferous tree or bush, rarely in deciduous; from 1 to 35 feet up; usually rather low and on a limb away from trunk; variable in structure; hay, stiff dead grass, weeds, fine spruce twigs, pine needles, spiders' webs, cocoons, etc., lined with fine black roots or hair, plant-down and stems of "hairycap" moss. *Eggs:* 3 to 6, usually 4; .61 to .72 by .45 to .51 in.; ovate to short rounded ovate; white or creamy-white, spotted with browns, purplish and lavender; figured by E. A. Capen in "Oölogy of New England," Plate IV, Figs. 13, 14, and by F. M. Chapman in "The Warblers of North America," Figs. 52–54. *Dates:* June 15 to June 24, Massachusetts; May 24 to June 20, New Hampshire; May 30 to June 16, second week of July, Maine. *Incubation:* Period 12 or 13 days (Miss C. J. Stanwood); usually by female, male sometimes assists. One to two broods yearly.

Range. — Most of North and Central America. Breeds in Hudsonian, Canadian and Upper Transition zones from southwestern Mackenzie, central Manitoba, northern Ontario, central and southeastern Quebec and Newfoundland south to north-central British Columbia, central Alberta, southern Saskatchewan, northern Minnesota, northern Wisconsin, central Michigan, southeastern Ontario, southwestern New York and central Massachusetts, and in mountains of New York, Pennsylvania, West Virginia, Maryland, and western North Carolina (casually); winters from central Vera Cruz south to southern Mexico and through Central America to Panama, also from central Florida (casually), to Haiti, Cuba (casually) and Porto Rico; in migration occurs west to Oregon and California; casual in the Bahamas; accidental in Alaska, Greenland and the Bermuda Islands.

Distribution in New England. — *Maine:* Common migrant; common summer resident, breeding only locally in southwestern part. *New Hampshire:* Common migrant; less common summer resident, breeding locally south of White Mountain region on higher elevations. *Vermont:* Common migrant; local summer resident. *Massachusetts:* Common migrant; less common, more local, summer resident, breeding chiefly in northwestern counties. *Rhode Island and Connecticut:* Common migrant.

Season in Massachusetts. — May 1 to June 4 (summer); September 6 to October 19.

Haunts and Habits. The Magnolia Warbler is to my mind the most strikingly beautiful warbler that makes its home in New England. The Blackburnian Warbler with its orange front may be preferred by many, but that bright front is its chief glory, while the Magnolia Warbler's beauties are distributed to every part of its graceful little

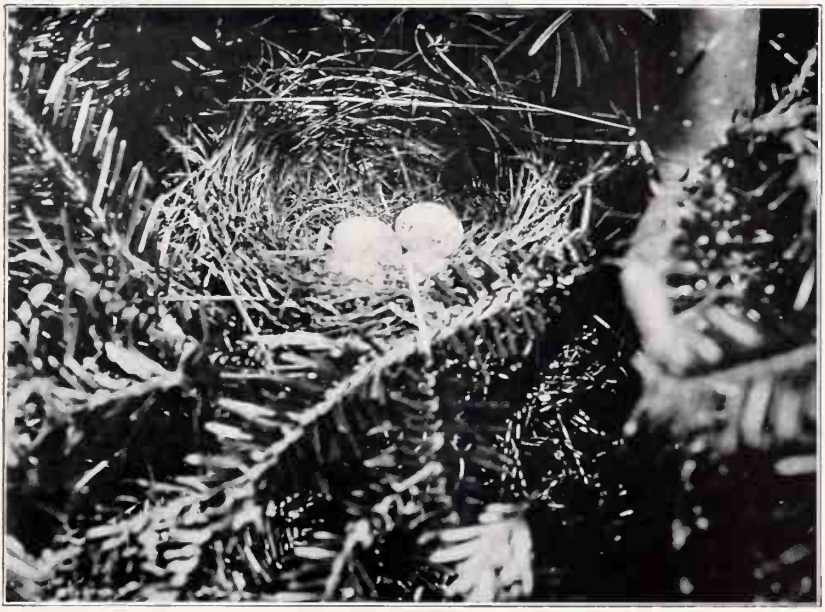


Summer Distribution of the Magnolia Warbler in Massachusetts.

form. Seen from above or below with both wings and tail partly spread while flitting from branch to branch in eager pursuit of its insect prey, or while engaged in paying court to its prospective mate, the male of this species is a wonderfully beautiful creature. Active and vivacious, he seems to take little rest throughout the livelong day.

This warbler is most common in southern New England for a few days about the middle of May, though in some seasons a small flight occurs in western Massachusetts during the first week in May. Like other Canadian warblers of the coniferous woods, it can subsist and find shelter in such woods before the leaves have developed on the broad-leafed trees. Later, however, when the deciduous trees are clothed with young leaves, it may be found in migration almost anywhere in the woods and even in orchards.

Wherever spruce trees grow in western and northern Massachusetts at an altitude of 1,200 feet or more this warbler is likely to breed. In the October Mountains we rarely found it in the breeding season except in or near spruces, and that was the case in other parts of western Massachusetts, but the bird is more or less local and though it breeds in some spruce patches east of the Connecticut River, it is not to be found in all of them.



Photograph by Miss Cordelia J. Stanwood

FIG. 80. — NEST AND EGGS OF MAGNOLIA WARBLER

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Photograph by Miss Cordelia J. Stanwood

FIG. 81. — MAGNOLIA WARBLERS IN JUVENILE PLUMAGE

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Spruces, hemlocks and balsam firs of the Canadian flora seem to be its favorite trees at this season.

Both male and female labor at nest building though the female is the real builder, while the male's part seems to be largely that of bringing material, although he often enters the nest. Miss Cordelia J. Stanwood, who watched a pair while they were nest building, gives the following account of the progress of the work: "First bits of spider's silk were laid in the shape of the nest on the brush-like needles of the fir. The bird seemed to secure the spider's floss by rubbing it against the twigs with her breast. Later bits of hay or cinquefoil stems were bent in the shape of a loop or swing and secured by the silk. The next step was to bend the material in the shape of a circle around the top, always pressing it into shape with the breast and securing it at intervals with knots of spider's silk. A frame similar to this seems to be constructed by the Magnolias always before filling in the foundation. The birds were three days placing the foundation of hay and cinquefoil, and three days lining the nest with horsehair. I have seen nests that I thought might have been constructed more quickly, so little material was used either for foundation or lining" [1] (see Fig. 80).

The young are said to hatch in from twelve to thirteen days and then remain in the nest about ten days. Mrs. Margaret M. Nice, writing from Amherst, Massachusetts, August 17, 1928, says that from July 14 to 21 a male was seen feeding full-grown young and on August 9 there were two fledglings with short tails "just out of the nest" which were fed by the female. As she is positive there was but one pair of Magnolia Warblers to be found during the season in that region, she considers this good evidence of two broods, but probably one brood is the rule.

June and July are largely given to the nesting and to the care of the young which must be fed and attended for some time after they leave the nest. Early August is spent in wandering about while the young develop more fully and grow fat and strong in preparation for their southern journey, which begins about August 15, and most of them have left New England before the last of September.

So far as is now known the Magnolia Warbler feeds entirely upon insects and other small forms of animal life. During the spring migration it may often be seen feeding on small caterpillars and plant-lice in the maples planted along village streets. In the orchards it feeds to repletion on such geometrids as the canker-worms.

Economic Status. Mr. W. L. McAtee writing of its food and the usefulness of the bird in woodlots says: "Almost all its known items of insect food are sorts injurious to woodlands. It takes weevils, leaf-beetles and click beetles, leaf-hoppers, plant-lice and scale insects, saw-fly larvæ and ants, caterpillars and moths. Surely a record of good deeds to match the excellence of appearance of this feathered gem." [2]

[1] Auk, Vol. XXVII, 1910, p. 388.

[2] Bulletin of the Roosevelt Wild Life Forest Experiment Station, Vol. 4, No. 1, 1926, p. 77.

Dendroica cerúlea (Wilson). Cerulean Warbler.

Plate 83.

Description. — Often as small as Northern Parula Warbler, but usually slightly larger; formed much like other members of the genus; tail nearly even. *Adult male:* Above blue with a slightly grayish cast, brightening to cerulean blue on top of head, where slightly marked on each side with black, back streaked with black; sometimes a white or whitish streak over and behind eye, or a black line through it; wings, tail and larger tail-coverts black or blackish, the feathers edged blue, except tertials which are edged whitish; two white wing-bars; tail with white spot on inner web of each feather near tip except on two middle feathers; below white with a band of bluish-black crossing where throat and breast join and extending down each side of breast, sides streaked same; bill black above, grayish-blue below at base; iris brown or brownish-black; legs and feet deep blue. *Young male in first breeding plumage:* As adult male except for browner or more worn wings and tail. *Young male in first winter plumage:* Similar in markings to adult male but not nearly so blue, more gray, and washed so heavily with olive-green as to appear greenish; no black marks on back and white not so pure; sometimes quite yellowish below; "bill brown, paler below; legs and feet blue" (J. W. Atkins). *Adult female:* Varying from light bluish-gray to olive-greenish above (Ridgway), and not marked on back and upper tail-coverts with black, as in male; wings and tail marked as in male, but edgings olive-greenish or grayish; two white wing-bars, narrower than in male; sides of head and all below whitish, often more or less tinged yellowish; cheeks and ear-coverts usually darker, often nearly as dark as back; a dark streak through eye, a whitish or yellowish white stripe over eye; usually more or less dark streaks on sides and flanks. *Young female in first winter plumage:* Similar to young male, but duller green above; black streaks on back and black on upper tail-coverts lacking; more yellow below and streaks on sides less distinct; "bill brown, paler below; feet and legs bluish" (J. W. Atkins). *Young in juvenal plumage:* Drab or drab-gray above with brownish feather-edges; wings and tail brownish-black with lighter greenish edgings, except those of primaries which are bluish-gray (all edges greenish in female); below grayish-white tinged yellow; two white or whitish wing-bars.

Measurements. — Length 4.00 to 5.00 in.; spread about 7.30 to 8.10; folded wing 2.40 to 2.70; tail 1.70 to 1.90; bill .46 to .50; tarsus .60 to .65. Female smaller than male.

Molts. — Very similar to those of Myrtle Warbler (see page 237) in sequence, time and area, except that prenuptial molt into first breeding plumage apparently does not involve any tertials.

Field Marks. — A small warbler near Northern Parula Warbler in size. *Adult male:* Our only "true blue" warbler; almost sky-blue above, with black streaks on back, two white wing-bars, and showing white spots on each feather of spread tail, except two middle ones, which are chiefly black; white below with a bluish-black band across upper breast (sometimes interrupted in the middle), and black streaks on sides. Female bluish-gray to olive-green above; young, distinctly olive-green; female often bluish on top of head, and both without black marks on back, but *wings* and tail marked with white or whitish, much as in adult male; both are whitish or yellowish below, unmarked; a pale streak over eye and a dark line through it; female often resembles same sex of Black-throated Blue Warbler, but lacks white spot on wing which latter has, and has two white or whitish wing-bars which the other has not.

Voice. — Alarm note a sharp *chip* (Lynds Jones). Calls, a lisping note, similar to those of other warblers of this genus, and also a *tsup* or *tchep*, like that of the Myrtle Warbler. Song, recalls that of the Parula Warbler and resembles it; the syllables *tse, tse, tse, tse, te-e-e-e-e-e-e-e-e*, serve to recall it to mind, the song rolls up the scale quietly and evenly (F. M. Chapman); *zwee-zwee, zwee wee-ee* (E. H. Eaton); a buzzy, slightly rolled *cheer-cheer-cheer-cheer-cheer-cheer-cheeee* (G. W. Gray); "*see-see-seep*, with an ascendant note on the last syllable" (Mrs. R. B. Harding).

Breeding. — On lands heavily timbered with deciduous trees or in small groves of large trees, often in swampy woods or near water, or in tall thin southern pines. *Nest:* In coniferous or deciduous tree

from 15 to 90 feet up; usually well out on a limb; rather shallow; built of weed stems, bark-strips, fine grass, snake skins, lichens, etc., and lined with hair, feathers or soft moss, sometimes cotton, caterpillars' webs or spiders' webs used in construction. *Eggs:* 3 or 4; .60 to .70 by .46 to .53 in.; ovate to short rounded ovate; pale bluish-white or greenish-white to creamy-white, spotted and speckled with reddish-brown and sometimes with lavender or lilac, spots usually show a tendency to gather toward large end, but often the egg is well covered; figured by F. M. Chapman in "The Warblers of North America," Figs. 55, 56. *Dates:* May 15 to June 15, Ohio. *Incubation:* Wholly or chiefly by female.

RANGE. — Eastern and central United States and southern Ontario, to central-western South America. Breeds mainly in Austral zones from northeastern Nebraska, northern Iowa, southeastern Minnesota, southern Wisconsin, southern Michigan, southeastern Ontario and central New York south to northeastern Texas, Louisiana, central Alabama, and northern Georgia and east to western Pennsylvania, eastern Maryland, western Delaware (locally) and western North Carolina (locally); winters from Panama, Colombia and northern Venezuela, south to Peru and central Bolivia; in migration straggles to Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey and eastern Pennsylvania; casual in Cuba, Grand Cayman, and the Bahamas; accidental in Colorado, New Mexico and Lower California.

DISTRIBUTION IN NEW ENGLAND. — Casual or accidental visitor. Apparently no specimen has been taken in Maine or Vermont. Records: *New Hampshire:* Peterboro, May 27, 1918, one seen by G. W. Hagar.* *Vermont:* Wilmington, 1908, "a small number" seen by Mr. and Mrs. F. G. Floyd;[1] St. Johnsbury, May 29, 1909, a pair observed by Miss Inez Addie Howe;[2] May 20, 1917, another bird seen by Miss Howe;[3] Montpelier, May 14, 1927, two seen by Miss Emily Clark.[4] *Massachusetts:* Cohasset, 1874, female taken, found in the Bryant collection by R. H. Howe, Jr.;[5] Amherst, May 10, 1909, one seen by Miss Ethel M. Smith, May 10 to 16, 1920, bird seen by Miss Smith and others;[6] Greenfield, May 19, 1909, one seen by Miss Caroline Hamilton, May 13, 1922, one seen by Mrs. Clifton Field;[7] Savoy, July 17, 1920, two birds seen by William J. Cartwright;[8] Winchendon, May 28, 1924, one seen by Mrs. F. B. Spalter.[9] *Rhode Island:* Cumberland Hill, May 22, 1878, a male taken by C. M. Carpenter and reported by Ruthven Deane;[10] Lonsdale, May 14, 1893, male taken by William Deardon.[11] *Connecticut:* Stratford, April, 1841, bird seen by James H. Linsley;[12] Suffield, June 12, 1875, male taken by Erwin I. Shores and reported by H. A. Purdie;[13] Seymour, May 10, 1888, "a female taken in a flock of Parulas" by Edwin H. Eames;[14] Bridgeport, May 12, 1900, male taken by Henry W. Beers;[15] Fairfield, June 1, 1927, one seen by Aretas A. Saunders.[16]

HAUNTS AND HABITS. The little Cerulean is the bluest of New England warblers. It is almost sky-blue. It is only casual or accidental here, as it is considered extremely rare east of the Appalachian ranges. Probably it has visited these states many times,

* Since the above was written, a New Hampshire specimen has been taken; Holderness, June 5, 1929, male seen by Mrs. Richard B. Harding, taken June 8, now in collection Boston Society of Natural History. J.B.M.

[1] Vermont Bird Club, Bulletins Nos. 4 and 5, 1910, p. 23.

[2] *Ibid.*, pp. 12, 13.

[3] Vermont Botanical and Bird Clubs, Joint Bulletins Nos. 4 and 5, 1919, p. 23.

[4] Shields, Miss Mabel A., and Coffin, R. L.: *in litt.*

[5] Howe and Allen: Birds of Massachusetts, 1901, p. 107.

[6] Smith, Miss Ethel M.: *in litt.*

[7] Hamilton, Miss Caroline: *in litt.*

[8] Cartwright, William J.: *in litt.*

[9] Spalter, Mrs. F. B.: *in litt.*

[10] Bulletin, Nuttall Ornithological Club, Vol. IV, 1879, p. 185.

[11] Howe and Sturtevant: Birds of Rhode Island, 1899, p. 80.

[12] Merriam, C. Hart: A Review of the Birds of Connecticut, 1877, pp. 15, 16.

[13] Bulletin, Nuttall Ornithological Club, Vol. II, 1877, p. 21.

[14] Auk, Vol. V, 1888, pp. 431, 432.

[15] Sage, Bishop and Bliss: Birds of Connecticut, 1913, p. 155.

[16] Saunders, Aretas A.: *in litt.*

but as it is a bird of the tree-tops it is difficult to identify. Especially so are the females and young, as they are inconspicuous and obscurely marked. In the north they frequent the tops of such tall trees as maples, lindens, walnuts and elms. They resort to upland woods and wooded hillsides, where, according to Dr. A. W. Butler, they dart out like flycatchers in pursuit of flying insects, search about leaves, twigs and blossoms like vireos, and creep about on the large limbs like the Black and White Warbler. They seem to prefer the more open woods, where they sometimes come down from the tree-tops and work more in the manner of a chickadee or a creeper; in nest-building the female comes to the ground for much of her material, working very busily and paying little attention to spectators. Dr. P. L. Hatch says that their longer flights are made in "jerking curves."

In May, while mating, the males are very pugnacious and fight furiously and persistently. However, these combats are soon settled and the nest building, defence of the nest and care of the young take their attention. Early in July when the young are out of the nest, the males stop singing and molting begins. In August they are off on their southern journey.

As I have never seen this bird in life, the above account is drawn from the writings of other observers. While it is very evident that the Cerulean Warbler feeds chiefly on insects, little is actually known regarding the species that it takes. Mr. A. H. Howell tells us that the food contents of the stomachs of four birds taken in Alabama consisted of hymenoptera, beetles, weevils and caterpillars.[1]

Economic Status. See page 197.

Dendroica pennsylvánica (Linnæus). **Chestnut-sided Warbler.**

Plate 83.

Description. — Similar in form to other members of this genus, but not so slender as most; bill short and stout; tail nearly even. *Adult male in breeding plumage:* Forehead more or less whitish, shading into olive-yellow crown, both sometimes flecked with black; triangular space from bill to eye, extending downward on side of jaw and narrowing as it goes, and connecting with stripe over eye to back of head, black; back of head very variable but often chiefly black, usually with a central pale spot and streaked with whitish, grayish or yellowish; back and scapulars also variable but usually olive-yellow, broadly marked with pale-edged black streaks; rump yellowish-olive-green or grayish, sometimes streaked black; upper tail-coverts black margined olive or light gray; wings black with yellowish-olive-green feather-edges (often grayish on primaries or their coverts), and two broad pale yellow wing-bars, sometimes nearly fused into a large patch; tail black with olive-gray feather-margins; three outer feathers on each side with long white patches at end of inner web; black patch below eye extends nearly or quite to a broad chestnut stripe which runs down sides and flanks; sides of head and neck and rest of lower plumage white; "bill black sometimes bluish at base below; iris dark brown; legs, feet and claws slaty-blue" (N. S. Goss); "bill blue-violet black; iris dark grayish-brown; tarsi ranier-blue" (F. B. White). *Adult male in winter plumage:* Chiefly bright greenish-yellow above rather indistinctly streaked dusky on back and rump; eye-ring white; *sides of head gray without black*, but chestnut streaks on sides conspicuous. *Young male in first winter plumage:* Similar to adult male in winter plumage, but little or

[1] Birds of Alabama, 1924, p. 298.

no chestnut on sides. *Adult female in breeding plumage:* Similar to adult male above, but colors duller, black and chestnut restricted and broken, tail and wings browner. *Adult female in winter plumage:* Similar to young male in first winter plumage. *Young female in first winter plumage:* Similar to adult female or young male in winter plumage, but always lacking chestnut on sides. *Young in juvenal plumage:* Varying from pale reddish-brown to dark brown above, back spotted or streaked dusky; wings and tail much as in adult, but duller and wing-bars lighter and paler; brown of upper plumage, gradually paling, extends down over sides of head and neck, throat, breast and sides (graying on sides of head and throat); elsewhere below whitish or creamy-white; "bill and feet dusky-pinkish-buff, becoming black" (J. Dwight).

Measurements. — Length 4.60 to 5.25 in.; spread 7.40 to 8.25; folded wing 2.30 to 2.65; tail 1.90 to 2.10; bill .41 to .50; tarsus .62 to .75. Female smaller than male.

Molts. — Similar to those of Myrtle Warbler (see page 237), but postnuptial molt beings in July.

Field Marks. — Size near that of Chipping Sparrow. *Adult male:* Unmistakable; the only warbler that is all *white below* except a *broad chestnut stripe* on each side at all seasons. *Adult female:* Similar but duller, often showing some chestnut on sides. *Fall adults and young* all have *white eye-ring,* not seen in spring, but have neither yellow cap nor white on sides of head and neck, which are gray; young in fall are plain olive-green above, whitish below, with two buffy wing-bars.

Voice. — Ordinary calls a soft *tsip,* another louder and harsher, much like that of Black and White Warbler, and a rather loud *chip;* one variation of the song resembles *wée-see-wée-see-wée-see,* each syllable higher than the preceding, except the sixth which is lower than the fifth, another common song much like that of Yellow Warbler (H. D. Minot); a full voiced warbler with two main songs, both subject to wide variation, one of them being rendered *twit-a-wit-a-wit-a-wit-wee-chew* (G. H. Thayer); one male so varied his song with imitations of those of the Redstart and the Black-throated Green and Magnolia Warbler that it was difficult to tell which warbler was actually singing (Miss C. J. Stanwood).

Breeding. — In sproutlands, undergrowth or shrubbery, in or near the edges of upland woods, in neglected, bushy fields and pastures, in shrubbery along brooksides and along bushy roadsides; pine or other coniferous woods generally avoided. *Nest:* In low bush, sapling or brier patch from 1 to 6 feet up; not very neatly built, of coarse grass, bark-strips, plant fibers, bunches of spiders' web, plant down, etc., lined with fine grasses, rootlets and horsehair, one or all. *Eggs:* 4 usually, 5 rarely; .61 to .68 by .46 to .52 in.; rounded ovate to elongate ovate; white, creamy-white or buffy, spotted chiefly at large end with varying shades of brown, purplish and lavender, variable, some heavily blotched, others finely dotted; figured by E. A. Capen in "Oölogy of New England," Plate IV, Figs. 11, 12, and by F. M. Chapman in "The Warblers of North America," Figs. 57–59. *Dates:* May 20 to June 5, Virginia; May 23 to June 4, Connecticut; May 22 to June 15, Massachusetts; June 4 to July 4, Maine. *Incubation:* Period 10 to 11 days (F. L. Burns); 10 days (Mrs. E. O. Marshall). One brood yearly, possibly two in some cases; fledgings seen August 11.

Range. — Eastern and central North America (except northern part) and Central America. Breeds mainly in Transition Zone from south-central Saskatchewan, south-central Manitoba, central Ontario and southern Quebec south to central-eastern Nebraska, south-central Missouri, southern Illinois, northern Indiana, northern Ohio, Pennsylvania and central New Jersey and in mountains to eastern Tennessee and northwestern South Carolina; casual in migration in southern Florida, the Bahamas, Bermuda Islands and southern Mexico; winters from Guatemala to Panama; accidental in northern California and southern Greenland.

Distribution in New England. — Common migrant; common summer resident, up to altitudes of 2,000 feet (more or less), but not breeding in dense forests.

Season in Massachusetts. — (April 27) May 1 to September 20.

Haunts and Habits. The common and familiar Chestnut-sided Warbler was once a comparatively rare bird in the Atlantic states; Audubon met with it but once; Wilson

saw little of it; Nuttall, who considered it rare, evidently knew little about it, and saw very few. Since his time, however, its numbers have increased until it has become one of the commonest of eastern warblers. Its increase was favored by the destruction of the primeval forest and the continued cutting away of subsequent growths, and later by the increase of neglected fields and pastures with their growths of bushes and brambles, for it is not a frequenter of deep woods, nor yet of well-kept gardens, orchards or farmyards, but prefers neglected or cut-over lands, with a profusion of thickets and briers. So we may find it usually away from houses, in low roadside and brookside thickets, or in sprout-lands rather recently cut over. As the coppice grows up the bird retires to other quarters or to the edges of the woods. It is not shy, nor does it seek the company of man, but seems rather indifferent to his presence, unless he too closely approaches its lowly domicile.

It is not, perhaps, so beautiful as some of the more retiring warblers, but as Professor Lynds Jones says, it impresses one as an exquisite, and there is something about it which makes the "day brighter, the wearing field work easier and the hours of fasting forgotten," when it flies into view. Perhaps its dainty, immaculate white vesture, with its clean-cut chestnut stripes, so unique among the small birds, together with its jauntiness and trimness, set it apart from and above all its fellows. Robert Ridgway rates it as "perhaps the prettiest of all our warblers." This is high rating from a distinguished source.

Normally it is a bird of the shrubbery and lower branches, a bird of the open and sunlight. It rarely penetrates the deep woods though sometimes it may be found traveling through them with other warblers in migration. It sings from tree-tops but more often from bush-tops, and anyone walking or driving slowly along country roads will have many opportunities to see and hear it. In migration it may be seen with other warblers gleaning insects well up in the trees even in town or city parks.

The Chestnut-sided Warbler commonly appears in Massachusetts during the first or second week in May — a joyous, tuneful bird conspicuous among the nearly naked trees and shrubbery. As the days grow warmer it is seen hunting amid the thickets, often with slightly drooping wings and jaunty cocked-up tail. As the foliage develops, courtship is rife and nest building begins. Five or six days suffice for the building of the nest, if the weather continues favorable. My former assistant, the late F. H. Mosher, watched a pair throughout the building of the nest. The female did all the actual work. She laid straws and plant fibers in a fork of an arrow-wood bush, then went to a tent caterpillar colony and tearing off some of the web bound the forking branches about with it, thus tying them together and forming a deep cup-like framework for the habitation; she also bound the foundation firmly in place with more of the same web, then brought dried grasses or straws and placed them around to form the sides of the nest and bound them to the branches with more caterpillars' webs. Having finished the sides, she put in a lining of soft grasses, fine rootlets and plant fibers. This nest when completed at the end of five days was much less bulky than the usual nest of the Yellow Warbler, and much firmer, with walls not more than one-fourth as thick. When the nest is finished care

should be taken not to disturb it or handle the eggs, as the birds are then extremely likely to desert it.

The male is devoted to his mate and their offspring, often feeding her while she is sitting upon the nest and taking his share of the care of the young. Miss Florence A. Merriam tells of a male of this species that persisted in feeding the young of a Redstart, much to the disgust of their mother. He continued to follow and feed them after they had left the nest. Later she saw this male, or another in the same place, feed a sparrow-like young bird, much larger than himself. Evidently the parental instinct was strongly developed in this bird.[1]

The young remain in the nest about nine or ten days. When they have learned to fly well, the family retires to bushy lands, where they begin molting in July, and in August they are ready for their southward journey. Before the month closes most of them have left New England, but some are still passing until the last days of September.

"The food of the Chestnut-sided Warbler is such that the bird must be exceedingly useful in woodland and shrubbery, and in orchard and shade trees as well, whenever it frequents them. It is probable that at times it destroys considerable numbers of parasitic hymenoptera, as it is rather expert as a flycatcher; but it is very destructive to many injurious beetles and caterpillars, being one of the most active consumers of leaf-eating insects. Small borers or bark-beetles, plant-bugs and plant-lice, leaf-hoppers, ants and aphids are eaten.

"In seasons of great want it eats a few seeds. Audubon says that he once shot several birds in Pennsylvania during a cold spell and snowstorm in early spring, and that the only food in their stomachs was grass seeds and a few spiders, but the birds were emaciated and evidently half starved." [2] It not only takes hairless caterpillars but it eats numbers of the hairy larvæ of the gipsy moth and brown-tail moth, as well as tent caterpillars and the forest tent caterpillars. In autumn it takes some wild fruit.

Economic Status. No thorough investigation of the food of this species has been made, but as it is an assiduous caterpillar hunter it must be a factor in the control of these pests.

Dendroica castánea (Wilson). **Bay-breasted Warbler.**

Plate 83.

Description. — Form rather robust for a warbler; bill rather stout, larger and wider where it forks below than in the next species; tail nearly even. *Adult male in breeding plumage:* Crown chestnut; forehead and sides of head black; a large buffy patch on side of neck, sometimes extending to nape; back and scapulars grayish-buffy, growing grayer on rump and upper tail-coverts, all of which usually are streaked or spotted with black; wings and tail blackish-brown or blackish margined olive-gray; ends of middle and greater wing-coverts white, forming two white wing-bars; white patches near ends of inner webs of two or three outer tail-feathers on each side, largest on 1st feather; chin, throat, upper breast,

[1] Auk, Vol. VII, 1890, pp. 404–406.

[2] Forbush, E. H.: Useful Birds and Their Protection, 1907, p. 194.

sides and flanks chestnut; rest of lower plumage white, usually tinged buffy; bill black above and at end below, rest pale bluish; iris brown; legs light brown, feet yellowish-brown. *Adult male in winter plumage:* Above olive-green more or less streaked black on crown and back, crown usually with concealed chestnut or traces of it; tail and wings as in spring, but wing-bars tinged yellowish; below whitish tinged slightly yellowish on throat and buffy on breast, abdomen and under tail-coverts; more or less chestnut on sides. *Young male in first winter plumage:* Similar to adult male in fall, but no chestnut in crown and little or none on sides; bill and feet blackish. *Adult female in breeding plumage:* Very variable; back, wings and tail resembling adult male in same plumage, but chestnut of crown mixed or narrowly streaked with black; checks gray and black mixed; buffy patch on side of neck smaller and inconspicuous; chestnut on throat and sides pale or in patches, and more yellowish below. *Young female in first winter plumage:* Similar to young male in same plumage, but lacking blackish streaks on crown, and usually no trace of chestnut on sides or flanks. (The following directions for distinguishing the young of this species in autumn from the young of the Black-poll Warbler seem to be reliable. Bay-breasted Warbler: Under tail-coverts tinged yellowish; *flight-feathers abruptly margined white on inner webs;* no noticeable streaks on breast. Black-poll: Quite uniformly washed greenish-yellow below, nearly back to vent; sides of breast and sometimes of belly with obsolete streaks; *under tail-coverts pure white; flight-feathers only gradually paler toward inner edge.*) *Young in juvenal plumage:* Quite different from later plumages; above blackish-brown, including wings and tail (back of one female dull olive-green) with paler margins; below white or whitish, spotted more or less above and below on feather-tips with black; "bill and feet pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 5.00 to 6.00 in.; spread 8.25 to 9.30; folded wing 2.70 to 3.00; tail 1.80 to 2.25; bill .47 to .53; tarsus .71 to .90. Female smaller than male.

Molts. — Similar to those of Myrtle Warbler (see page 237), but the prenuptial molt into adult breeding plumage involves no tertials.

Field Marks. — Size larger than Chipping Sparrow. *Adult male in spring:* Large, dark and unmistakable; grayish back, streaked black; black face, but big whitish (buffy) patch on side of neck; *chestnut crown, throat, upper breast and sides* and whitish under plumage. *Adult female in spring:* Back and wings as in male, but head grayer, with black only in streaks and chestnut much restricted. *Adults and young in autumn:* Resemble closely autumnal Black-poll Warblers, and often are indistinguishable in the field, but arrive earlier and should be looked for in August and early September before the Black-polls come; above olive or olive-green; two white wing-bars; *some birds show traces of reddish-brown on the sides,* otherwise no obvious streaks; below *buffy including under tail-coverts,* which usually are white in Blackpoll Warbler.

Voice. — Calls, fine sharp *chips* or *tsips;* song, perhaps the highest and squeakiest of them all; sometimes a "high hissing *tswis, tswis, tswis,* but oftener a succession of shrill sibilations in the form of a swell, *wiss wiss wiss wiss wiss wiss wiss*" (W. L. Dawson); on the breeding grounds, *see-wh-tee, see-wh-tee, see-wh-tee-see, see-tee, ce-tee, eet* (Miss C. J. Stanwood); in migration a poor weak monotonous saw-filing note (Mrs. J. G. Farwell, Jr.); "in a grouping based on songs, the Bay-breast should stand in a quintette with the Blackburnian, Black-poll, Black and White and the Cape May — five thin-voiced sibilant singers — the Bay-breast's the most inarticulate of the lot, sometimes the loudest" (G. H. Thayer).

Breeding. — In northern coniferous or mixed forests, often on low ground near ponds and lakes. *Nest:* In conifer from 3 to 20 feet up, on branch toward end or near trunk or in top of small tree, large for the bird; built of fine twigs and moss or lichens, lined with fibrous rootlets, pine needles and hair. *Eggs:* 3 or 4, usually 4; .65 to .73 by .50 to .56 in.; ovate or short rounded ovate; bluish-green or greenish-gray, spotted or blotched with brown and often with a ring of confluent blotches of brown and lilac around large end; figured by E. A. Capen in "Oölogy of New England," Plate IV, Figs. 9, 10, and by F. M. Chapman in "The Warblers of North America," Figs. 60, 61. *Dates:* June 15, southern Maine; June 14, southern Ontario. *Incubation:* By female. One brood yearly. (See Fig. 79.)

Range. — Eastern and central North America (except northern part) to northern South America. Breeds in Canadian zone from northeastern Alberta, central Manitoba, northern Ontario and southern

Ungava (Quebec) south to southern Manitoba, northern Michigan, south-central Ontario, southern New Hampshire, southern Maine, southern New Brunswick and Nova Scotia; winters in Panama and Colombia; casual in migration west to Montana, South Dakota, eastern Nebraska and Texas; rare on the Atlantic slope south of Virginia; occurs in migration from Guatemala to Costa Rica; accidental or casual in the Bermuda Islands and Mexico.

DISTRIBUTION IN NEW ENGLAND. — *Maine:* Rare migrant; rare local summer resident, chiefly in northern part. *New Hampshire:* Uncommon to rare migrant; uncommon summer resident from White Mountains northward to altitudes of 4,000 feet, also on Mount Monadnock. *Vermont:* Rather irregular migrant, occasionally common; recorded in summer, but not known to breed. *Massachusetts:* Rare and irregular migrant, sometimes more common. *Rhode Island:* Uncommon to rare migrant. *Connecticut:* Rather irregular migrant, occasionally common.

SEASON IN MASSACHUSETTS. — May 8 to June 3 (June 9, 19, 20, July 24); August 17 to October 13.

HAUNTS AND HABITS. This large, dark, gentle warbler is usually considered a rare bird in New England. It seems to be more common, however, in migration from the Connecticut Valley west than it is in eastern New England. Occasionally it becomes common in spring in eastern Massachusetts. With us it is a late spring and early fall migrant, not arriving in numbers until after the middle of May and beginning to move southward in the last half of August. It may be more common in autumn than it is believed to be, as it is very difficult to distinguish it at that season from the autumnal Black-poll Warblers, when both are moving through the tree-tops together. If one can find these species on a steep hillside or mountain slope where he can approach more nearly at the level of the birds, it is a great advantage.

The Bay-breasted Warbler may be looked for in fall before the Black-poll comes; usually in the spring migration the Bay-breast is seen in dense woods of coniferous or mixed trees. It spends most of its time amid the foliage of trees, moving about rather deliberately after the manner of the vireos, and searching among the leaves and twigs for its insect prey. It is by no means confined to the tree-tops or to dense forests, as it is seen at times in low scattered trees and occasionally a few may be seen in the more suburban parts of cities.

This warbler breeds chiefly in northern forests, and is not known to nest in southern New England. The nest is not very artfully concealed, though usually well hidden from below by thick spruce foliage. Messrs. P. B. Philipp and B. S. Bowdish say that "it appears" that the female sings from the nest, in answer to the male, a song weaker than his.[1] The male feeds the female and both feed the young. The young leave the nest in about ten days. Most members of this species pass southward in late August and September, largely through the Mississippi Valley region, which may account for their usual rarity along the Atlantic seaboard.

The food of the Bay-breasted Warbler, like its breeding habits, is little known. It takes locusts, caterpillars, ants, beetles and leaf-hoppers, and both parents feed insects to their young.

ECONOMIC STATUS. See page 197.

[1] Auk, Vol. XXXIV, 1917, p. 271.

Dendroica striáta (J. R. Forster). Black-poll Warbler.

Plate 84.

Description. — Similar in form to Bay-breasted Warbler, but bill smaller, more slender and white spots on tail-feathers different in shape. *Adult male in breeding plumage: A black cap covers whole top of head* coming down to eyes, *below which lower eyelids and sides of head are white;* elsewhere above gray to pale olive, broadly streaked black, streaks narrower or lacking on rump and upper tail-coverts; wings and tail dark brown, former with light olive to yellowish-olive edgings, latter with olive-gray edgings and white spots near inner web of each of two or three outer tail-feathers on each side; two white or yellowish wing-bars; below white, a double row of black streaks (two on either side), each beginning in a narrow line at base of bill on either side of chin, broadening and separating on sides of throat and extending down sides and flanks; bill above and end below black, rest paler; iris brown; legs light brown, feet yellowish-brown. *Adult male in winter plumage:* Very unlike spring male; *no black cap;* olive-green above gradually becoming olive-gray on upper tail-coverts and more or less streaked black; wings and tail marked much as in spring but tail browner, edgings of wings greener, and wing-bars more or less tinged yellow; sides of head pale olive-yellow; an indistinct pale olive-yellow streak above eye; below whitish washed with pale olive-yellow, whitening somewhat on abdomen; sides and flanks streaked blackish. *Young male in first winter plumage:* Usually like adult male in winter plumage, but oftener without black streaks on top of head, and sides streaked dusky; under tail-coverts white. *Adult female in breeding plumage:* Above olive-green to grayish, streaked blackish from bill to rump, where streaks are fainter; wings and tail much as in male, but white wing-bars usually tinged yellow; a pale ring around eye and a light streak above it; lower plumage varying from a light olive-yellowish wash to whitish, streaked finely on sides of head and more coarsely from sides of throat down sides and flanks with blackish; abdomen and under tail-coverts white. *Adult and young female in winter plumage:* Practically as young male in fall, but said to average whiter below. *Young in juvenal plumage:* Above olive-gray indistinctly mottled or streaked black; wings and tail deep brown; wings with olive-greenish edgings, those on tertials and wing-bars white or whitish, greater and middle wing-coverts blackish, middle wing-coverts "sub-apically white on *both* webs, greater coverts on *outer* web, the white narrowly tipped with black"; tail edged whitish and a white spot on each of two outer feathers on each side; resembles juvenal of *D. castanea* in conspicuous spotting of the under parts, but apparently differs from it in the black tips of the wing-coverts (F. M. Chapman), these sometimes worn off; below whitish or yellowish, spotted or mottled with rounded dull black spots; "bill and feet pinkish-buff, the former becoming dusky, the latter sepia" (J. Dwight).

Measurements. — Length 5.00 to 5.75 in.; spread 8.32 to 9.70; folded wing 2.45 to 3.10; tail 1.80 to 2.25; bill .45 to .54; tarsus .65 to .75. Female smaller than male.

Molts. — Similar to those of Bay-breasted Warbler (see page 252).

Field Marks. — Size larger than Chipping Sparrow. *Adult male in spring:* Black-capped and white-faced like Black-capped Chickadee, but without black throat; a grayish or greenish bird, streaked black above; white below with black streaks from sides of chin along sides nearly to tail; two white wing-bars; black cap distinguishes it at once from the Black and White Warbler, which works from side to side on trunk and limbs while Black-poll Warbler hops from twig to twig among the branches; no other bird like it. *Adult female in spring:* Without black cap or white cheeks; otherwise marked much as male above on back, wings and tail, but ground color olive-green to gray, yellowish below on sides, streaked from top of head and back down to sides with blackish; *no pale buffy patch on sides of neck* as in Bay-breasted Warbler. *Adults and young in fall:* Similar to autumnal Bay-breasted Warbler, but no chestnut on sides, and *under tail-coverts always white.*

Voice. — Alarm note a strong *chip;* call note a rather rough lisp constantly heard from trees in autumn; song a "high thin *tsit tsit tsit tsit,* delivered with a *crescendo* and *diminuendo,* last notes sometimes run rapidly together with almost a sputtering effect" (R. Hoffmann); "a string of six to twelve

PLATE 84

PLATE 84

BLACK-POLL WARBLER
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ADULT MALE

FEMALE

MALE IN FIRST
WINTER PLUMAGE

BLACKBURNIAN WARBLER
Page 256

MALE

FEMALE

BLACK-THROATED GRAY WARBLER
Page 262

MALE

YELLOW-THROATED WARBLER
Page 259

MALE

BLACK-THROATED GREEN WARBLER
Page 264

MALE

FEMALE

Allan Brooks

or more short, equal and equally divided sibilant notes, cob-web thin and glassy-clear, — uttered rather fast; the whole song smoothly swelling in volume to the middle or the second third and then smoothly falling off" (G. H. Thayer); there are many variations and sometimes more syllables or less, but the song is unmistakable.

Breeding. — Among cone-bearing trees, often in swampy groves. *Nest:* Usually low in a spruce or other evergreen tree, but rarely on the ground; formed of mosses, lichens, twigs, rootlets and grasses, lined with fine mosses or lichens and feathers. *Eggs:* 4 or 5; .67 to .74 by .50 to .54 in.; ovate; creamy to grayish-white, speckled, spotted and blotched boldly with shades of reddish-brown, purplish-gray and lilac, often tending toward a wreath about larger end; figured by E. A. Capen in "Oölogy of New England," Plate IV, Figs. 7, 8, and by F. M. Chapman in "The Warblers of North America," Figs. 62–64. *Dates:* June 28, New Hampshire; June 15 to early July, Maine.

Range. — North America, Central America and South America. Breeds in Hudsonian and Canadian zones from limit of trees in northwestern Alaska, northern Yukon, northern Mackenzie, northern Manitoba, northern Ungava, northern Labrador and Newfoundland south to central British Columbia, central Manitoba, northern Michigan, northern New York, southern Vermont, central New Hampshire, southern Maine, southern New Brunswick and Nova Scotia; winters from British Guiana, northern Venezuela and Colombia to eastern Brazil, Ecuador and (casually) Chile; west in the United States in migration to Montana, Wyoming, Colorado and New Mexico (casually); migrates chiefly through the Bahamas and West Indies; accidental in southern Greenland and southern Oaxaca.

Distribution in New England. — Common to abundant migrant, most abundant in autumn; in Maine, New Hampshire and Vermont a summer resident, chiefly in northern parts or on the higher mountains, most common in summer in northern Maine; may breed casually in western Massachusetts.

Season in Massachusetts. — May 7 to June 28 (summer); August 25 to November 7.

Haunts and Habits. The Black-poll Warbler arrives in New England on the crest of the great spring wave of bird migration; a few may appear early in May, but when their sibilant insect-like songs come from orchards, shade trees and woodlands on every hand we hear them in sadness, for they signify that the great vernal flight of the beautiful wood sprites soon will pass — that spring wanes and summer is at hand. Usually they are about the last of the wood warblers to appear and although they come in multitudes they keep mostly in leafy tree-tops, where they are lost to view, and where their thin voices are noticed only by those who have learned to listen for the warblers and to distinguish their faintest chirp from that of the insects which now swarm in woods and fields. As Mr. W. L. Dawson says, the monotonous droning of this warbler chimes in with the murmur of bees' wings and "lies softly upon the pulsing tribute of the heated air by which the sounds are alike borne heavenward."

The Black-poll Warbler breeds in the dark evergreen forests of the north. Its home is among the spruces and firs. It nests in the wilderness of Labrador and Alaska, penetrating well into the Arctic Zone wherever it can find its favorite stunted evergreens, and southward throughout most of the forested regions of Canada. It is, perhaps, the most abundant and wide-spread of all the American wood warblers, and yet we seem to have learned little about its breeding habits or its food.

It migrates from the borders of the Arctic Zone to South America. Its autumnal migration begins usually in September. It is difficult for the beginner in bird study to believe that the little green birds that come trooping down from the north in autumn are

the same that went north in their black and white vesture in the spring; silently they pass or with only a faint lisping chirp in place of the songs of the spring migration. From far-off Alaska, from the great Northwest Territories, from Hudson Bay and Labrador, the Black-polls come down toward the peninsula of Florida and steer their course across Cuba and the West Indies to South America. In spring their hosts return by the same route. Mr. C. J. Maynard, who landed April 27, 1884, on a small key in the Bahamas, says: "We found this little spot of land, which consisted of two acres, fairly covered with warblers, which were constantly arriving and departing. Of all the thousands which we saw, by far the greater number were Black-polls." He also says that the numbers of these birds that came and passed were countless, even beyond estimation, and that for two days more the flight continued with numbers somewhat abated.[1] Some of these birds died apparently from exhaustion. They are supposed to fly several hundred miles across the Caribbean Sea before they reach land. When we consider that this key was only a tiny spot in the wide belt that must have been covered by this migration, we can only wonder at the vast numbers that pass northward. While migrating this warbler may be found wherever trees grow, and often also along fences and stone walls in fields and pastures, and in autumn even along weedy roadsides. Its motions are rather deliberate for a warbler, and it is usually unsuspicious and approachable.

Little seems to be known about its food. It takes immense numbers of canker-worms and other small caterpillars, fall web-worms, many plant-lice, small grasshoppers and locusts, beetles, ants and gnats.

Economic Status. This species undoubtedly is a useful bird in orchard and forest because of its immense numbers and wide-spread migration.

Dendroica fúsca (Müller). Blackburnian Warbler.

Other names: HEMLOCK WARBLER; TORCH-BIRD.

Plate 84.

Description. — One of the smaller *Dendroicæ*, and the only one that presents a black and orange front. *Adult male in breeding plumage:* Above chiefly black; an oval spot on fore crown, often with a narrow extension on forehead, a stripe over eye merging with the top of a large patch behind ear-coverts, a spot below eye, chin, throat and upper breast orange; a streak on either side of back (sometimes tinged orange), a large patch on fore wing, including tips of middle and greater coverts, and edges of tertials, white; rest of wings blackish, the flight-feathers narrowly pale-edged; feathers of rump and upper tail-coverts edged whitish; tail black very narrowly edged grayish, inner webs of two to four outer tail-feathers on each side largely white; below, from breast to tail, white, tinged yellow or orange, and streaked on sides, flanks, and rarely on breast, with black; bill brown to blackish, sometimes lighter below; iris dark brown; legs and feet dark or dusky-brown. *Adult male in winter plumage:* Similar to same in breeding plumage, but orange paler, black of upper plumage duller or brownish with light feather-edges, and two broad white wing-bars *not fused into a patch. Young male in first winter plumage:* Similar to adult male in fall, but yellow takes place of orange, and black is mixed with grayish or brown-

[1] Birds of Eastern North America, 1896, p. 585.

ish-olive, thus resembling adult female. *Adult female in breeding plumage:* Similar to both adult and young male in pattern, and similar in color to young male in winter plumage, but yellow deeper, more orange, and more apparent on crown; abdomen paler. *Adult female in winter plumage:* Similar to same in spring, but orange paler, crown spot nearly obsolete; bird taken in Colombia November 10 had bill black above, light brown below, iris brown, legs and feet light brown (M. G. Palmer); another taken in New Jersey August 27 had bill horn-color, lighter below, iris wood-brown, feet slaty-brown. *Young female in first winter plumage:* Much as adult female in fall and hardly distinguishable, but breast averaging paler, some nearly white, wing-edgings usually duller, and white in tail restricted. *Young in juvenal plumage:* Bistre or sepia above, indistinctly streaked with blackish-brown on back; wings and tail blackish-brown with olive-buff edgings, and marked much as in adult female; two white wing-bars; three white tail-patches on each side; below white or whitish, spotted on throat, breast, sides and flanks with sepia; "bill and feet pinkish-buff, becoming dusky later" (J. Dwight).

Measurements. — Length 4.47 to 5.50 in.; spread 7.60 to 8.55; folded wing 2.50 to 2.80; tail 1.70 to 2.10; bill .37 to .45; tarsus .60 to .80. Female smaller than male.

Molts. — Similar to those of Myrtle Warbler (see page 237), but molt into winter plumage of both old and young begins in July or early August.

Field Marks. — Size smaller than Chipping Sparrow. *Adult male in spring:* Unmistakable; no other bird of this size is so black above with a bright orange throat and upper breast; black and orange markings of head are distinctive. *Adults and young in autumn:* More difficult; color patterns are practically the same, but instead of the large white wing-patch there are two white or whitish wing-bars, the black has turned more brownish or grayish-olive and the orange duller yellow or yellowish.

Voice. — Call, a *chip* like calls of other *Dendroicæ;* song, extremely thin, very variable, common form by which the bird is recognized "*wee, see, see, see, zĭ, zĭ, zĭ* ending in the thinnest note imaginable" (R. Hoffmann); or *wee-seé-wee-seé-wee-seé* or *wee-seé-iek*, another a plain *tsee-tsee-tsee-tsee-tsee-tsee-tsee-tsee* in an ascending scale (O. W. Knight); two main songs with many variations *tsvvi, tsvvi, tsvvi, tsvvi*, or a variation *sissi-vit sissi-vit sissi-vit sissi-vit*, almost languidly uttered in each case with fine sibilant tone; another common song begins in same way but is more hurried, "and ends on a sharply-ascending scale, with a sort of explosion of small crowded notes" (G. H. Thayer); *zillup, zillup, zillup* (Bradford Torrey); one male had three songs, (1) *tral tral tral treeee*, the last note on an ascending scale, (2) *zee zee zee zee zúmp*, the last note lower than the rest, (3) *zip zip zip zip zip zée-yer*, last two syllables higher and thinner than the others (Mrs. M. M. Nice).

Breeding. — Chiefly in deep woods of coniferous or mixed trees, especially among hemlocks, spruces or white pines. *Nest:* In coniferous tree usually, in deciduous rarely; from 6 to 80 feet up, usually toward end of limb or near top of tree; variable in size and materials, sometimes thick and heavily built, sometimes light and airy; commonly made of coniferous twigs and lined with fine rootlets or hair (resembling nest of Chipping Sparrow), sometimes also fine grasses or feathers; some *usnea* lichen also usually employed; bark-strips and pine needles occasionally utilized, and spiders' webs and moss. *Eggs:* usually 4; .64 to .72 by .45 to .54 in.; very variable; rounded to elongate ovate; bluish-green to grayish-white with spots and blotches of lilacs and browns, sometimes large, distinct or confluent about large end; figured by E. A. Capen in "Oölogy of New England," Plate IV, Figs. 5, 6, and by F. M. Chapman in "The Warblers of North America," Figs. 65, 66. *Dates:* June 6 to 26, Massachusetts; June 4 to 26, New Hampshire; June 5 to 15, Maine. *Incubation:* Chiefly or wholly by female.

Range. — Eastern and central North America (except more northern parts) to central South America. Breeds chiefly in Canadian and Upper Transition zones from south-central Manitoba, northwestern Ontario, southern Quebec and Cape Breton Island south to central Minnesota, southern Wisconsin, southern Michigan, southeastern Ontario, New York, southern Connecticut and in the mountains from Pennsylvania to northwestern South Carolina and northern Georgia; occurs in migration west to southern Saskatchewan, North Dakota, Nebraska, Kansas and Texas; winters from Colombia and Venezuela to French Guiana and central Peru, less commonly north to Yucatan and casually to southern Florida;

casual in the Bahamas, the Isle of Pines and Tobago Island, West Indies; accidental in Utah, New Mexico and California.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common migrant; common local summer resident in northern parts and on higher lands in more southern portions, up to about 3,000 feet. *Massachusetts:* Uncommon to rare migrant, occasionally common; rather rare summer resident in eastern part, more common in northern and western portions. *Rhode Island:* Uncommon to rare migrant. *Connecticut:* Uncommon to common migrant; rare summer resident, less rare in western parts.

Season in Massachusetts. — (April 21 and 24) May 1 to October 3 (October 10).

Haunts and Habits. This little bird is the most brilliant of all our warblers. It has not that perfection of beauty in all its parts which characterizes the Magnolia Warbler, for its rump and tail are rather commonplace, but its front is a brilliant and intense flame-color. Dr. Elliott Coues says there is nothing to compare with the exquisite hue of the chin, throat and upper breast and he calls it "Prometheus, the Torch-bearer." When the low morning sun shines full upon its gorgeous frontlet, backed by the dark recesses of the pines, it flashes out like a burning flame as the bird turns its breast suddenly to the light. Sometimes its front seems to change almost to a brilliant pink, and again it disappears, as the bird turns a "cold shoulder" to the looker-on. Probably no artist or engraver can represent in its full intensity the beautiful flame-color of this warbler's throat as its lambent sheen reflects back the sunlight, but neither can we depict in their full beauty the colors of any of the brighter warblers as seen in the light of the orb of day and in their natural environment. To appreciate them we must see the living birds against the vital background provided by the Creator.

Dr. Coues tells us that if we study the crude descriptions and figures of the early naturalists we may possibly go back even to Buffon for the first recognition of this bird in his "*Figuier orangé*," but there is no doubt about the bird described by Pennant and Latham, from whom it received the name by which it is known today, in honor of a Mrs. Blackburn, an English lady. Why it was so named does not appear, though both *black* and *burn* seem appropriate when the bird's colors are viewed.

This warbler is a type of arboreal bird. The whispering forest is its home. It dwells among the tall timber, and in migration often passes much of its time near the very tops of trees. It is generally regarded as rare in migration in Massachusetts, though probably untold numbers pass over the state every year, but only a few stop here. It is not when the birds are migrating that we see them, but when they *stop* to rest. Massachusetts is a long narrow state stretching from east to west and many migrating birds pass over it in the night and so are never seen by the inhabitants. I can recall but two instances in my lifetime when myriads of Blackburnian Warblers stopped here, though other similar flights probably have come when I was not there to see. At sunrise one morning in early May, many years ago, when the tiny green leaves were just breaking forth on the tall trees of the woods near Worcester, Blackburnians were everywhere in the tree-tops. They swarmed in the woods for miles. Years later, in Amesbury, on another May morning, the night flight, having met a cold wave from the north with a light frost, had

come down to earth and the birds were busily looking for food; many Blackburnians and many other warblers were in the low shrubbery, in the grass, and even on plowed fields in every direction all through the village and about the farms. The sudden cold had stopped them. A few hours later as the day grew warmer they disappeared and were not seen again.

Probably the number of birds of this species breeding in New England is much greater than the records indicate. They breed chiefly in dense woods among pine, spruce and hemlock trees. The female is inconspicuous, and the male spends most of his time amid the branches where he is seldom seen or heard, or if heard his song is mistaken for that of some of the more common warblers whose notes resemble it. The nest is often high in the trees and hard to find. I have never found one, but have seen the birds in the breeding season in nearly all parts of Massachusetts I have visited, except the southeastern part. Sometimes the song of the male has been the only indication of his presence, the bird keeping well concealed in thick pines or in tall spruces, hemlocks or deciduous trees, but usually a search led to the discovery of the singer and sometimes the pair appeared.

While with other warblers during the migration season this species may occur anywhere that trees grow, but in the breeding season I have always found it in or near the woods. The chief spring migration in Massachusetts occurs from the 10th or 15th to the 20th of May, and it returns in late August and early September.

The nest is built chiefly or wholly by the female and Mr. A. A. Cross of Huntington, Massachusetts, who has watched the building of one, tells me that it was completed in three days, and that most of the work was done during the mornings.

The bird is quite active. It catches insects in the air occasionally, but spends most of its feeding time in searching among the branches. Like other warblers it takes many moths and caterpillars, and both adult forms and larvæ of beetles that feed on trees. According to Mr. H. D. Minot this warbler must be able to subsist on berries in time of stress for he records that he saw a pair on April 21 (the earliest record for Massachusetts) feeding on ivy berries.[1]

Economic Status. See page 197.

Dendroica domínica dominica (Linnæus). Yellow-throated Warbler.

Other name: YELLOW-THROATED GRAY WARBLER.

Plate 84.

Description. — Similar in form to Blackburnian Warbler and somewhat similar in markings below, but colored differently, larger and bill longer. *Adult male in breeding plumage:* Above, chiefly bluish-gray; forehead black, this black extending back on sides of crown and in some cases over most of it; stripe over eye *yellow before eye*, white behind it, merging with white patch on side of neck; small spot in middle of forehead and small crescent below eye white, rest of sides of head black; wings and tail blackish-brown with light or pale grayish edgings; two broad conspicuous wing-bars, and extensive patches at

[1] Land-Birds and Game-Birds of New England, 2nd edition, edited by William Brewster, 1895, p. 115.

ends of inner webs of two or three outer tail-feathers on each side, white; chin, throat and upper breast lemon-yellow; rest of lower plumage chiefly white; a black stripe from side of head runs down side of neck and dividing on sides and flanks forms broad streaks there; wing linings chiefly grayish-white; bill, iris and feet brown (C. J. Maynard); bill black, legs and feet brown (W. H. Phelps). *Adult male in winter plumage:* Similar to spring male, but washed with brownish above and sometimes on sides and flanks. *Young male in first winter plumage:* As adult male in winter plumage, but sometimes not quite so gray, and primary-coverts not so black. *Adult female in breeding plumage:* Like adult male in same plumage and sometimes hardly distinguishable, but usually with less black on head, sides of throat and neck. *Adult female in winter plumage:* Resembling adult female in spring, but browner above and on sides. *Young female in first winter plumage:* Above olive-brown or bluish-brown, slightly mottled or streaked dull black; wings and tail dull black with "hoary-plumbeous-gray" edgings; outer tail-feathers with white spots; "bill and feet brownish-black" (J. Dwight).

Measurements. — Length 4.70 to 5.75 in.; spread 8.00 to 8.75; folded wing 2.45 to 2.80; tail 2.00 to 2.30; bill .50 to .60; tarsus .60 to .70. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by a partial molt involving body plumage and wing-coverts (beginning in May in Florida and in June in South Carolina); first breeding plumage by wear; adult winter plumage by complete postnuptial molt (beginning in July); adults have but one (postnuptial) molt and assume breeding plumage by wear.

Field Marks. — Chipping Sparrow size; bill rather long for a warbler; creeps along the branches like a Pine Warbler or a Black and White Warbler. *Adult:* A *gray* warbler with two *prominent broad white wing-bars*, yellow line from bill to near eye, changing to white over eye and passing into a white patch on side of neck, behind black cheeks; *throat and upper breast lemon-yellow*, elsewhere below white with black streaks on sides. *Young:* Similar, but browner above, yellow on throat paler.

Voice. — Song, *ching, ching, ching, chicker-cher-wee* with a wild, ringing, carrying quality, which recalls that of the Water-Thrush (F. M. Chapman).

Breeding. — Usually in the south in piney woods or among deciduous trees, always where "Spanish moss" (*Tillandsia*) grows. *Nest:* Often in live oak or pine, from 10 to 120 feet up; usually concealed in moss or pine foliage; sometimes composed of Spanish moss and pensile, but usually on limb or in fork; built of fine grasses or bark-strips, sometimes bound with Spanish moss or caterpillars' silk, sometimes snake skins are used; lined with soft materials such as blossoms of Spanish moss, cotton, hair or feathers. *Eggs:* 4, rarely 5; .66 to .76 by .51 to .56 in.; short rounded ovate; greenish-white to grayish or ashy-white, dotted and spotted chiefly around large end with lavender, purplish-gray, umber, wine-red and blackish; figured by F. M. Chapman in "The Warblers of North America," Figs. 67, 68. *Dates:* April 2 to late May, South Carolina; April 26 to May 26, North Carolina; April 7 to 30, Virginia. *Incubation:* By female chiefly or wholly. One or two broods yearly.

Range. — Southeastern North America and West Indies. Breeds mainly in eastern part of Lower Austral Zone, chiefly east of the Alleghanies from southern Maryland and central Delaware to Alabama and central Florida; winters chiefly in Florida, Bahamas, and Greater Antilles and also, but less commonly, north to South Carolina; in migration casually north to Pennsylvania, New Jersey, New York and Massachusetts; from Ohio to the Mississippi Valley its place is taken by a western race, *D. d. albilora.*

Distribution in New England. — Accidental visitor. Not recorded from Maine, New Hampshire or Rhode Island; doubtfully recorded from Vermont and Connecticut. Records: *Massachusetts:* Dedham, one taken by George C. Browne nine or ten years prior to 1878 and in his collection, recorded by Henry A. Purdie, who saw it there;[1] Springfield, one seen in May, 1892, by William W. Colburn;[2] Plymouth, April 27, 1918, a pair studied a long time by Miss Minnie K. Batchelder (the male seen later by H. L. Barrett);[3] Rockport, May 22, 1918, a female seen by Mrs. William F. Eldredge;[4] September

[1] Bulletin, Nuttall Ornithological Club, Vol. III, 1878, p. 146.
[2] Morris, R. O.: Birds of Springfield and Vicinity, 1901, p. 36.
[3] Batchelder, Miss Minnie K.: *in litt.* [4] Eldredge, Mrs. William F.: *in litt.*

26 or 27, 1922, one identified by Mrs. M. Sibbel Turnbull;[1] Wareham (Onset), October 13 and 14, 1922, one seen by C. A. Robbins;[2] Randolph, June 5, 1925, one observed by William C. Wheeler.[3]

Season in Massachusetts. — April 27 to November 4.

Haunts and Habits. The Yellow-throated Warbler, a mere accidental visitor from the south, is a handsome, well-marked species. On its southern breeding ground it often keeps mainly to the tops of tall pines, and as its creeping gait along the branches resembles that of the Pine Warbler, it is commonly overlooked, but when it comes down into low shrubbery it is easily identified. I have seen the bird only in Florida, where it kept in thick woods exploring the lower branches of trees and the tops of shrubbery. It also frequents open piney woods and mixed growths containing some pine trees. Its song has a ringing quality, resembling that heard in the songs of the Water-Thrush and the Indigo Bunting.

Mr. Arthur T. Wayne, who is very familiar with the bird in the coastal region of South Carolina, says that there it is seldom found in the breeding season except where the Spanish moss grows, and its nest is almost invariably built in festoons of that moss. In his "Birds of South Carolina" (1910) he gives an excellent account of the breeding of this bird.

The food of the Yellow-throated Warbler is little known. Mr. A. H. Howell tells us that examination of nine stomachs of the species, taken in Alabama, indicates that its food consists mainly of "flies, beetles, ants and other hymenoptera and spiders."

Economic Status. See page 197.

Dendroica dominica albilóra Ridgway. Sycamore Warbler.

Description. — Similar to Yellow-throated Warbler (see page 259), but bill smaller; streak over eye *usually white or yellowish-white from bill to eye*, not yellow as in Yellow-throated Warbler, and white patches on tail-feathers averaging larger; bill black; "iris brown; legs, feet and claws olive-brown, bottoms of feet greenish-yellow" (N. S. Goss):

Measurements. — Average about the same as those of Yellow-throated Warbler, except bill which averages about .44 in. Female smaller than male.

Molts. — Similar to those of Yellow-throated Warbler.

Field Marks. — Same as those of Yellow-throated Warbler; typical adults might be distinguished in strong light by *lack* of yellow from bill to eye, and possibly by shorter bill.

Voice. — Similar to that of Yellow-throated Warbler; song recalls that of Indigo Bunting, but "softened and with a falling cadence all the way through, thus; *see-wee, see-wee, see-wee, swee, swee, swee, swee*, the last four notes uttered more rapidly, but becoming fainter" (A. Allison).

Breeding. — Similar to that of Yellow-throated Warbler.

Range. — Central United States, Mexico and Central America. Breeds in Austral zones of Mississippi Valley from southeastern Nebraska, southern Wisconsin, southern Michigan, Ohio, West Virginia and western North Carolina south to eastern Texas and Louisiana; winters from Puebla, Tepic and Colina (Mexico) to Nicaragua and Costa Rica and casually in the lower Rio Grande Valley; occasional in migration east to South Carolina; accidental in Connecticut.

[1] Turnbull, Mrs. M. Sibbel: *in litt.* [2] Robbins, C. A.: *in litt.* [3] Wheeler, William C.: *in litt.*

Distribution in New England. — Accidental visitor. One record: *Connecticut:* Fairfield, May 18, 1925, an adult male found at the Birdcraft Sanctuary, badly injured, by Frank Novak.[1]

Haunts and Habits. This Mississippi Valley form of the more eastern Yellow-throated Warbler resembles it so closely in form, haunts and habits, that it would be a difficult bird to distinguish in the field. As it has occurred once in New England, it is likely to occur again, and it is quite possible that some of the sight records given under the Yellow-throated Warbler may refer to this race of the bird.

Nothing specific is known of the food of this form, nor of its economic status.

Dendroica nigréscens (J. K. Townsend). Black-throated Gray Warbler.

Plate 84.

Description. — *Adult male in breeding plumage:* Above chiefly gray; back, scapulars, upper tail-coverts and sometimes rump streaked black; top of head chiefly or wholly black; a spot of yellow before eye; sides of head largely black; a white stripe from over eye to back of head and another down lower jaw, extending down side of throat; wings and tail black, ash-brown or dusky, with gray edgings; two broad white wing-bars; inner margins of secondaries and tertials white, and greater part of inner webs of three outer tail-feathers on each side white, 4th more or less white; below chiefly white; chin, throat and upper breast and broken streaks down sides and flanks, black; "bill black; iris brown; legs and feet dusky-brown, sometimes nearly black" (Ridgway). *Adult male in winter plumage:* Similar to adult male in spring, but tinged more brownish above; black streaks above and below somewhat obscured, and throat feathers margined white. *Young male in first winter plumage:* Similar to adult male in fall, but browner above, chin white, top of head more or less brownish-gray, except at sides and back of crown, and no white on secondaries; white below tinged yellowish. *Adult female in breeding plumage:* Very similar to adult male, but top of head usually gray streaked black, gray above duller, dusky streaks above narrow or indistinct, and those below narrower and grayish. *Adult female in winter plumage:* Similar to same in spring, but plumage softer and more washed with brown above and on sides; *dusky streaks above obsolete or wanting. Young female in first winter plumage:* Very like adult female in fall and often indistinguishable, but usually with less black above. *Young in juvenal plumage:* Brownish-gray above; a broad whitish stripe over and behind eye; below gray passing into white on abdomen; breast indistinctly streaked; wings and tail as in first winter plumage.

Measurements. — Length 4.30 to 5.40 in.; folded wing 2.35 to 2.65; tail 2.10 to 2.35; bill .42 to .50; tarsus about .70. Female smaller than male.

Molts. — Similar to those of Yellow-throated Warbler (see page 260).

Field Marks. — Size near that of Chipping Sparrow, but more slender; a black and white bird with gray back. *Adult male:* A black cap, a wide black patch or stripe through and behind eye; a black throat and two white wing-bars; white below with black streaks on sides. *Female and young:* Very similar but less black, especially on top of head and on throat. *Young:* Browner above and on sides. All show much white in spread tail.

Voice. — Call, a low *chit;* song, *zee-ee-zee-ee, ze, ze, ze,* with the quality of the Black-throated Green Warbler's song (Mrs. F. M. Bailey); a slow drawling *wēē'-zy, wēē-zy, wēē-zy, wĕr* with variations, sometimes finishing instead of *wer* with *wēē-zy-weet;* again *tsewey, tsewey, tsewey, tsew;* or *zuēē, zuēē, zuēē, soop;* or *sĭ-sĭ-wēēzy, wēēzy͡we-tsú,* etc. (Grinnell and Storer).

Breeding. — Often in dense thickets of scrub oak and usually on dry lands, sometimes in pines or

[1] Saunders, Aretas A.: Auk, Vol. XLIII, 1926, p. 249.

firs. *Nest:* In shrub or tree, from 5 to 50 feet up or more; compact and deeply cupped, built of grass and weed stalks, and lined with fur, hair or feathers, but material of nest varies much. *Eggs:* 3 or 4; averaging .69 by .50 in.; ovate to short ovate; white to pale greenish-white, specked and spotted with brown and purplish and markings of pale lavender, often wreathed about large end; figured by F. M. Chapman in "The Warblers of North America," Figs. 69–71. *Dates:* May 14 to June 24, Washington. *Incubation:* By female. One or two broods yearly.

Range. — Western North America except northern part. Breeds in Transition Zone from southern British Columbia, northern Nevada, northern Utah, southwestern Wyoming and northern Colorado south to northern Lower California, southern Arizona and southern New Mexico; winters in southern Lower California and elsewhere in Mexico from Durango and Sinaloa to Michoacan and Oaxaca; accidental in Massachusetts.

Distribution in New England. — Accidental visitor. Records: *Massachusetts:* Milton, May 22 and 23, 1918, a pair carefully identified and male heard in song by Miss Ella F. Luther. Her identification was doubtless correct, as she had every opportunity for observation, but as no specimen was taken, it would hardly be accepted as a first record for New England;[1] Lenox, December 8, 1923, one seen, and on the following day it was found dead, specimen now in collection of the Boston Society of Natural History;[2] Malden, May 18, 1924, an adult seen by J. A. Farley.[3]

Haunts and Habits. The Black-throated Gray Warbler is a bird of the Pacific coastal region and the western mountain ranges, and is entirely accidental in New England. There seem to be individual birds, as well as men, that are obsessed with the wanderlust, or else they simply go astray and having once lost the way keep on wandering. Thus we may account for the accidental occurrence of western species in our territory. Eventually most of the birds of North America may be recorded here. Though we must record their occurrence here, these aberrant western birds can hardly be regarded as New England species. This warbler seems to be normally a bird of dense thickets or chapparal, an inhabitant of heavy but stunted mountain tree growths. It frequents both pine and oak, particularly the low-growing scrub oaks. It is not a remarkably active bird, and is likely to keep well within the foliage, as normally it is rather shy. I know nothing of the food or economic status of the species.

Dendroica chrysoparia (Sclater & Salvin). **Golden-cheeked Warbler.**

Note. Mrs. F. H. Clapp reports that she saw a Golden-cheeked Warbler in Southampton, Massachusetts, May 13, 1920; from her description the bird must have been a full plumaged male, as its head, throat and back were black and sides of head deep yellow. Her observations were reported in detail by Mrs. Bessie M. Graves. The late Mrs. Elizabeth Herrick, of Topsfield, wrote to me on June 13, 1921, that she (in company with Mrs. H. W. Perkins) had recently seen one of these warblers. The two ladies, she said, followed the bird about through the woods and confirmed their first observation. Any ornithologist knowing Mrs. Herrick would have had confidence in her assertion.

These reports will hardly constitute a first record for this bird in New England, however, as no specimen has been taken in this region, and the species must be relegated to the hypothetical list.

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[1] Luther, Miss Ella F.: *in litt.*

[2] Vorhees, Clark G.: Auk, Vol. XLI, 1924, p. 348, 349.

[3] Farley, J. A.: *in litt.*

Dendroica vírens (Gmelin). Black-throated Green Warbler.

Plate 84.

Description. — Formed like other warblers of the genus; tail nearly even. *Adult male in breeding plumage:* Above, bright yellowish-olive-green, sometimes spotted or streaked more or less with black, and occasionally with a yellow spot in center of forehead; sides of head and neck bright lemon-yellow; dusky streak through eye, and sometimes another from gape under eye, with more or less dusky streaking between them, extending over ear region; wings and tail dusky, their feather-margins slaty-grayish; two white wing-bars; two outer tail-feathers on each side white except outer edges, and 3rd to 5th white at end of inner web; chin, throat and upper breast (sometimes sides of breast also), velvety black; sides broadly streaked black; rest of under plumage white, tinged slightly yellowish; "bill black; iris dark brown; legs and feet dusky, under sides of toes greenish-yellow" (N. S. Goss); "bill blackish-slate; iris fuscous-black; tarsi blackish-plumbeous" (F. B. White). *Adult male in winter plumage:* Similar to male in spring, but black of lower plumage more or less broken by white or yellowish feather-margins or tips. *Young male in first winter plumage:* Like adult male in fall, but rarely with any black on back; chin and throat yellowish, showing little or no black, and less black on sides. *Adult female in breeding plumage:* Similar to adult male in spring but duller in color, black of chin and more or less of throat replaced by whitish or yellowish, and remaining black below broken or veiled by whitish margins and tips; much like young male in fall, but duller and more worn. *Young female in first winter plumage:* Similar to adult female in fall, but duller above and breast yellowish with little or no black; duller above than young male in same plumage. *Young in juvenal plumage:* Above brown to drab; wings and tail similar to adults; below white (throat tinged dusky), spotted or streaked on breast and sides with brown or dusky; a dusky streak through eye; "bill and feet pinkish-buff, becoming black with age" (J. Dwight).

Measurements. — Length 4.35 to 5.31 in.; spread 7.00 to 8.00; folded wing 2.30 to 2.61; tail 1.85 to 2.20; bill .41 to .48; tarsus .60 to .70. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt involving body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (in the south) about head, chin and throat, and by wear which removes pale edges and leaves the black pure; adults and young are now alike, but wings of young average more worn and brown, with duller edgings; adults have complete postnuptial molt (July), and acquire breeding plumage mainly by wear, though there may be some replacement of feathers about chin and throat.

Field Marks. — Size smaller than Chipping Sparrow. *Adult male:* Unmistakable in spring with its bright yellowish-olive-green back, *bright lemon-yellow sides of head and pure black throat,* black streaks on sides, two broad white wing-bars, white belly, and much white in tail. *Adult female:* Resembles male but is duller, and has only traces of the black throat. *Female and young in autumn:* Similar but lack the black throat, though black, gray or dusky traces of it are often seen in autumnal adult females or young males; commonly seen in pineries or among spruces or red cedars; the Golden-winged Warbler has a black throat, but is gray above with yellow cap and wing-bars, and no black on sides, also seldom seen among dark pines; the Golden-cheeked Warbler is brighter yellow on sides of head, with crown and back black.

Voice. — Calls, "a rather loud, full-toned *tsip,* and a reduplicated smaller *chip*" (G. H. Thayer); song has two forms, one quicker than the other, *zee zee zu zi* and *zi zi zi zi zee zu zi,* when singing frequently a chipping note is sometimes kept up between songs (R. Hoffmann); Bradford Torrey translates it as "trees, trees, murmuring trees," a pleasing, dreamy, drawling, reed-like lay; others change it to "cheese, cheese, a little more cheese," and Dr. C. W. Townsend sets it down as "Hear me Saint Theresa." Mrs. M. M. Nice recorded 274 repetitions of the song in one hour.

Breeding. — Usually among white pines or other northern coniferous trees. *Nest:* Commonly in coniferous tree, very seldom in deciduous tree, has been found in a barberry bush quite away from pines (Ned Dearborn); rarely very low, commonly from 15 to 70 feet up, when among scrubby spruce some-

times as low as 3 feet; deeply cupped, usually on horizontal or drooping limb; composed of twigs of conifers, bound with spiders' webs or those of caterpillars, lined with fine grasses, pine needles, bark-strips, hair or feathers. *Eggs:* Commonly 4; .58 to .73 by .49 to .53 in.; ovate to short ovate or short rounded ovate; white to grayish-white or creamy-white, spotted, speckled and blotched with browns, purplish and lilac-gray and some shell markings of lavender, usually wreathed somewhat around large end; figured by E. A. Capen in "Oölogy of New England," Plate III, Fig. 15, and by F. M. Chapman in "The Warblers of North America," Figs. 74–76. *Dates:* May 30 to June 15, Virginia; May 21 to June 17, Connecticut; May 30 to June 18, Massachusetts; May 30 to July 1, Maine. *Incubation:* Period 12 days (F. L. Burns); chiefly or wholly by female. One brood yearly, probably two occasionally.

Range. — Central and eastern North America and Central America. Breeds chiefly in Canadian and Transition zones from northeastern Alberta, central Saskatchewan, southern Manitoba, northern Ontario, southern Quebec and Newfoundland south to central Minnesota, southern Wisconsin, southern Michigan, southeastern Ontario, Pennsylvania, northern New Jersey, southern Connecticut and Long Island and throughout the Alleghanies south to northwestern South Carolina, northern Georgia and central Alabama; in migration occurs west to central North Dakota, eastern Nebraska, eastern Kansas, eastern Oklahoma and central Texas; winters from central-southern Texas through eastern and southern Mexico to Guatemala, Costa Rica and Panama, also occasionally in West Indies north to Cuba; casual in the Bahama and Bermuda Islands; accidental in California, Montana, Colorado, Arizona, southern Greenland and Island of Heligoland (Europe); a local subspecies breeds in eastern South Carolina.

Distribution in New England. — Common migrant and summer resident, mainly below 3,000 feet, rather less common and more local in Connecticut than in the rest of New England.

Season in Massachusetts. — (April 20) April 26 to October 27 (November 3).

Haunts and Habits. The wood warblers are known only to the initiated. They pass by in hosts in spring and autumn, but only those who seek them patiently will find them, unless as sometimes happens during migration, a severe cold wave with snow on the hills drives them out of the woods and into towns and villages, when we may hear of great numbers of beautiful birds "never seen before." He who wishes to make their acquaintance must go to the woods and hills early and often. Most people never hear the notes or see the form of a single individual of the feathered forest host.

The Black-throated Green Warbler was the bird that first led me to follow him and his companions into the dark pines. As a boy I early learned to know the common birds of farm and orchard, but I had never seen a flight of wood warblers until one still, bright morning in May I entered an old pinery near Worcester and, listening carefully, heard strange notes on all sides and caught glimpses of little forms darting and flitting among the branches. Then there came into view close by in a little opening, where the sun shone in, a brilliant male of this species, his green back, yellow cheeks and black throat fairly gleaming in the morning sun, and the white markings of his wings and tail flashing in and out as he moved among the dark branches. I thought it the most beautiful bird in the world and longed to possess it. It was my first real introduction to the wood warblers — a day never to be forgotten — and since then I have always had an affection for the gentle bird.

Like all the wood warblers it is fond of bathing, its bath tub often some pool in a mountain trout brook. One day as I stood beside such a brook, a very lovely male, disregarding my presence, alighted on a stone at my feet, and at once hopped into the

clear spring water and performed his ablutions, dipping into the stream and throwing off the sparkling drops in little showers. As he stood there in the sunlight which streamed through an opening in the tree-tops, he left an enduring picture in my memory.

The Black-throated Green Warbler usually arrives from the south early in May. In migration it may be found among all kinds of trees, where it searches for insects from the lower branches to the tree-tops. It rarely goes to the ground except to drink, bathe or gather nesting material. As the breeding season comes on it seeks the coniferous evergreens, particularly the white pines, in which it commonly nests in southern New England. If the trees are tall it spends much of its time among the higher branches. When nesting in dense spruce woods, it frequents trees near the edge of the forest. The male now sings at intervals through a large part of the day, its song harmonizing well with its surroundings and the gentle breeze in the tree-tops. It is typical of quiet, peaceful, woodland scenes. "His voice is suggestive of the drowsy summer days, the languor of the breeze dreamily swaying the pines, spruces, firs and hemlocks. It recalls the incense of evergreens, the fragrance of the wild strawberry, the delicate perfume of the *Linnaea*. No other bird voice is so potent to evoke that particular spell of the northern woods" writes Miss Cordelia J. Stanwood.

Once I heard an unusual song from this bird. On an August day in the year 1904, in Concord, Massachusetts, I heard what seemed to be a Warbling Vireo singing a "whisper song," but when the bird was called up to me it proved to be a Black-throated Green Warbler, for I saw it plainly as it sang this strange song three times on a limb of a birch hardly six feet from my face — another case of avian mimicry.

I have watched the nest building of this warbler and seen both male and female carrying nesting material, but if their attention is called to the watcher, they are very likely to leave their real nest and start building a sham nest in another location. One pair that I watched, seeing that their activities were observed, started a nest in an empty fruit can that had lodged on a limb of a white pine, but ceased carrying nesting materials there as soon as I left them. Mr. C. A. Reed says that he has known them more than once to carry straws to a place away from the real nest when closely watched. Many of the nests built among the pines come to grief, for always there are rapacious jays or red squirrels hanging about the pine woods.

The young birds remain in the nest from eight to ten days. Both parents care for their young with devotion. The female sometimes will throw herself in the path of an intruder and simulating a wounded bird, endeavor to entice him away. Soon after the young leave the nest they take to the tree-tops. Most of them are strong on the wing by early July. In August they have molted and are ready to start for the south. In some cases there are late birds (possibly second broods), as young have been seen still being fed by the parents during the last part of August. In autumn some of the young males attempt to sing, and their songs usually are more like those of the Cape May Warbler or the Bay-breasted Warbler than those of their parents. Most of them have left New England before the middle of October. Frosty nights hurry them along.

The food of this bird consists in part of leaf-rollers, and many species of leaf-eating caterpillars and beetles, also bugs, flies and gnats, plant-lice and mites. It goes to orchards near its favorite woods for canker-worms.

Economic Status. Apparently this is one of the most useful birds of the woods as it gorges itself on destructive insects, but no thorough investigation of its food has been made.

Dendroica tównsendi (J. K. Townsend). Townsend's Warbler.

Note. On November 26, 1927, Mr. Ralph E. Forbes saw on Naushon Island, Gosnold, Massachusetts, a bird that he is positive was of this species. As Mr. Forbes is a careful and trustworthy witness, as the bird is unmistakable in the plumage of the adult male in which apparently he saw it, and as he was able to follow it at close range for a long time, and to go home and consult his books and then find the bird and confirm his description again, there is no doubt that he actually saw this species; but as no specimen has yet been taken in New England, the bird must go on the hypothetical list.

Dendroica kírtlandi (Baird). Kirtland's Warbler.

Note. In "Records of Walks and Talks with Nature," by C. J. Maynard, Vol. IX, No. 2, for January 4, 1917, Mrs. Julia W. Sherman fully describes an adult male Kirtland's Warbler, which she and her daughter saw on May 26, 1916, at Roslindale, Massachusetts, and which they had every opportunity to observe with care; she even describes the colors of bill, legs and feet; but we have no record of the capture of a specimen in New England.

Dendroica vígorsi (Audubon). Pine Warbler.

Other name: PINE-CREEPING WARBLER.

Plate 85.

Description. — Size of Chipping Sparrow or larger; rather large and stout, and bill large and stout for a warbler; tail slightly forked. *Adult male in breeding plumage:* Above bright olive-green; wings and tail dusky or blackish-brown, with grayish edgings to flight-feathers; two rather broad white wing-bars, and most of terminal half of two outer tail-feathers on each side white; sides of head olive-green; lower cheek, chin, throat, breast and often upper part of abdomen yellow or greenish-yellow, usually streaked indistinctly with olive-green, but sometimes distinctly with dusky or blackish; rest of lower plumage whitish; wing linings grayish, bend of wing yellow; bill dark brown, paling at base below; iris brown; legs brown, feet brown or dark brown. *Adult male in winter plumage:* Similar to male in spring, but plumage softer and browner above, yellow below. *Young male in first winter plumage:* As adult male in fall and hardly distinguishable, but usually not quite so bright, and wings and tail not quite so dark. *Adult female in breeding plumage:* Similar to adult male in markings but much duller above, and lacking yellow below, but dingy whitish or grayish faintly tinged yellowish on upper breast; cheeks grayish and flanks tinged brownish. *Adult female in winter plumage:* Similar to female in spring but browner above and on wing-bars and flanks; yellowish on breast veiled with whitish. *Young female in first winter plumage:* Still browner than adult female, and much browner than young male; olive-brown with often no pronounced greenish above and no yellowish below; quite different from adult, but has same markings of wings and tail, and same white lower tail-coverts. *Young in juvenal plumage:* Above drab to olive-brown; wings and tail deep olive-brown, with gray or greenish-gray edgings, wing-coverts and tertials edged with drab or pale brownish; below olive-gray washed with color of back on throat and sides,

and indistinctly mottled with deeper gray; "bill and feet dusky-pinkish-buff, becoming blackish" (J. Dwight).

Measurements. — Length 4.95 to 5.75 in.; spread 8.40 to 9.60; folded wing 2.70 to 3.00; tail 2.00 to 2.45; bill .40 to .50; tarsus .65 to .77. Female smaller than male.

Molts. — Similar to those of Yellow-throated Warbler (see page 260).

Field Marks. — A large warbler about Chipping Sparrow size. In New England, usually seen in or near pines, where it hops and creeps along branches, the pitch pine being its favorite tree. *Adult male:* Upper plumage strong yellowish-green; two whitish wing-bars; throat and breast yellow, usually obscurely streaked on breast and sides, sometimes darkly streaked there, paling on belly; under tail-coverts white; colored much as Yellow-throated Vireo, but latter has a gray rump and yellow "spectacles" from lower forehead around eyes; Yellow-breasted Chat is brighter colored, larger, more robust and has no wing-bars; our other yellow-breasted warblers are either differently marked or colored above or have no wing-bars. *Female and young:* Show little or no yellow on breast and are duller above than male, wing-bars narrower and grayer but markings similar; resemble young Black-poll Warblers, but are paler below, not so yellowish.

Voice. — Call note a soft lisping chirp; song hardly a trill, although often called so; a slow monotonous succession of soft, sweet notes, given like the song of Chipping Sparrow, but slower, with longer intervals between the notes and much softer; without noticeable variation except as given in higher or lower key.

Breeding. — In pine, hemlock or cedar woods or groves. *Nest:* Usually on long limbs of pine at any distance from trunk and from 20 to 50 feet up, higher in the south, sometimes on a fork of the topmost branch; commonly in open woods, if in dense woods, usually near the edge or near some opening; fashioned of weed-stems, bark-strips, pine needles, pine twigs, caterpillars' or spiders' webs or similar material; lined with pine needles, fern-down, hair, bristles or feathers. *Eggs:* 3 to 5, usually 4, rarely 5; .64 to .72 by .51 to .55 in.; short ovate to ovate; white, greenish-white or grayish-white, boldly marked with dots, spots and blotches in shades of lilac-brown, blackish and purplish, with a tendency to gather round large end; figured by E. A. Capen in "Oölogy of New England," Plate V, Figs. 2, 3, and F. M. Chapman in "The Warblers of North America," Figs. 79–81. *Dates:* March 28 to May 13, South Carolina; March 15 to May 20, Virginia; May 8 to June 16, late July, Massachusetts. *Incubation:* By female. One or two broods yearly, in South Carolina said to have "sometimes three" (A. T. Wayne).

Range. — Eastern North America north to southern Canada. Breeds in Transition and Austral zones from central Saskatchewan, southern Manitoba, northern Michigan, southern Ontario, southwestern Quebec and southern Maine south to southeastern Texas, southern Louisiana, southern Alabama and Florida; west in migration to eastern Nebraska, eastern Kansas and eastern Oklahoma (where breeding); winters from Arkansas and coast of Virginia south to northern Tamaulipas and eastern Texas, southern Alabama, Florida and casually north to central New York and Massachusetts; occasional in Bermuda Islands and Nova Scotia; accidental in Prince Edward Island.

Distribution in New England. — Common migrant; common to rare summer resident; usually local, and confined largely to the Alleghanian region and in the breeding season chiefly to pines, becoming rare or absent in northern parts and on higher elevations.

Season in Massachusetts. — March 20 to November 25 (winter).

Haunts and Habits. The Pine Warbler is the gentle, modest minstrel of the pines. Dry, sandy land that has been much burned over and supports a sparse growth of pitch pines and scrub oaks is its chosen home. It is a common bird wherever pitch pines grow on the waste lands of Cape Cod, Marthas Vineyard and elsewhere, and it breeds locally also among red or Norway pines and white pines, and rarely among red cedars

PLATE 85

PLATE 85

PINE WARBLER
Page 267

ADULT MALE

ADULT FEMALE

PRAIRIE WARBLER
Page 273

MALE

PALM WARBLER
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ADULT

YELLOW PALM WARBLER
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ADULT MALE

WATER-THRUSH
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ADULT

OVEN-BIRD
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ADULT

LOUISIANA WATER-THRUSH
Page 284

ADULT

Allan Brooks.

and hemlocks. Its sweet monotonous song harmonizes well with the sighing of the summer wind through the branches, while shimmering heat-waves rise from the sandy soil. Its song is usually described as a trill, but is really a succession of soft notes, all delivered on the same pitch. (A trill is a rapid rendering of two differently pitched notes alternately, not separated by more than the width of a whole tone.) When the song is followed to its source, the bird usually will be found sitting on a pine limb, occasionally lifting its head to sing, or stealing quietly along the limb like a creeper, or hopping from twig to twig like any other warbler searching for its insect prey, or even fluttering out after some flying insect.

The Pine Warbler usually comes to us in the waning of the month of April (though stragglers may come even in March), and it may appear almost anywhere in migration, frequently with Yellow Palm Warblers, keeping mostly to the trees or shrubbery and occasionally alighting on the ground. As the breeding season comes on it will be found most of the time among pines. It mates very early, and at that season the males, influenced by jealousy, become pugnacious and often do battle for the favor of the modest, dingy female, making the woods resound with their angry chirps.

The nest usually is hard to find, as it is almost always concealed from below by foliage. I found one at Lake Quinsigamond, Massachusetts, that was only about fifteen feet from the ground, but have never seen another so low. Mr. Arthur T. Wayne says that in South Carolina, where the bird nests in giant southern pines, the nest is sometimes 130 feet from the ground.

The Pine Warbler is exceedingly devoted in caring for its little ones. Miss Fannie A. Stebbins tells of a young one that was kept in a school room in Springfield, Massachusetts, for parts of three days, where it was constantly fed by its parents, who flew in at a window although the school was in session.

By the last of October most of the Pine Warblers have left New England, but now and then one is seen in winter as far north at least as central Massachusetts. While migrating in October they gather in flocks and associate with other birds. I remember seeing a mixed flock of about 100 birds, composed mainly of Pine Warblers and Bluebirds, upon the ground, bushes and trees about a large nearly empty tide-water pool. The blue backs of the Bluebirds and the yellow breasts of the Pine Warblers seen in sunlight against the dark bottom of the pool and the overhanging shadowy pines made a charming picture to carry in the memory.

The Pine Warbler feeds largely on the insect pests of pine trees, caterpillars, moths, flies and plant-lice. In fall and winter it goes to the ground a great deal. It is fond of grasshoppers and locusts, as practically all birds are, but in autumn and winter it turns largely to vegetal food, such as pine seeds, birch seeds, and the berries of the waxmyrtle, ivy, the cornels and sumacs, the smaller wild grapes, etc.

Economic Status. This warbler apparently does no harm, and its feeding habits among the pines undoubtedly are beneficial to those trees.

Dendroica palmárum palmarum (Gmelin). Palm Warbler.

Other name: RED-POLL WARBLER.

Plate 85.

Description. — Form rather slender; bill also slender; feet small; wings average; tail rather long, slightly rounded and slightly forked. *Adults in breeding plumage (sexes alike or similar)*: Top of head chestnut, sometimes blackish near base of bill, where divided by a narrow whitish or yellowish line; elsewhere above grayish-olive-brown, brightened by a greenish or yellowish tint on rump, and all obscurely and narrowly streaked darker; wings and tail dusky with light greenish-yellow or olive edgings; two outer tail-feathers on each side with white patch on end of each inner web, 3rd sometimes shows a small white spot at end; a yellow stripe above eye, a dusky stripe or line through eye; eyelid pale yellowish or whitish; ear region brown; lower jaw whitish or yellowish; chin, throat, a little of upper breast and under tail-coverts yellow; rest of under plumage whitish, sometimes more or less tinged yellowish; throat, breast and sides more or less narrowly streaked with chestnut; female usually a little browner above and less yellow below; bill brownish-black or dusky, sometimes paler at base below; legs and feet olive-brown, under sides of toes greenish-yellow. *Adults in winter plumage:* Similar to adults in spring but browner above; feathers of chestnut cap broadly tipped brown, largely or entirely concealing the chestnut; stripe over eye, chin, throat and upper breast without yellow (whitish) and markings below more suffused; under tail-coverts yellow as in spring. *Young in first winter plumage:* Similar to adults in fall and hardly distinguishable from them, but not quite so rich and bright as adults; wing-edgings paler. *Young in juvenal plumage:* Above chiefly brown, streaked obscurely darker; below white with dusky spots and streaks; eye-ring whitish and dusky stripe through eye.

Measurements. — Length 4.50 to 5.50 in.; spread 7.50 to 8.40; folded wing 2.35 to 2.65; tail 2.00 to 2.45; bill .44 to .52; tarsus .65 to .75. Female smaller than male.

Molts. — Molts resemble closely those of Black-throated Green Warbler (see page 264).

Field Marks. — Size smaller than Chipping Sparrow, slender. *Adults in breeding plumage:* Above, olive-brown with chestnut cap; yellow stripe over eye; below *yellow on throat, upper breast and under tail-coverts, rest whitish;* lower fore plumage streaked more or less with chestnut. *Adults in winter plumage:* Similar but browner above, paler below; cap brown, paler or whitish on throat and upper breast; *streak over eye whitish,* and only *under tail-coverts still yellow. Young:* Much as fall adults, browner above and whitish below, but *under tail-coverts still yellow;* resemble young of Cape May Warbler, but yellow under tail-coverts distinguish the Palm Warbler, those of the Cape May Warbler being white; in all stages the Palm Warbler constantly wags its tail up and down, as if it were loosely hinged. See also *Field Marks* for next subspecies, page 272.

Voice. — Call, a *chip;* ordinary song *tsee tsee tsee tsee,* with a distinct swell (Lynds Jones); *wissa, wissa, wissa, wissa, wissa,* with no change of inflection (W. L. Dawson).

Breeding. — Usually on moist or swampy lands, among or near bushes or small trees. *Nest:* On ground, on a dry spot such as a hummock or tussock, and concealed more or less by grass or branches of small tree or bush; built mainly of weed-stems, grasses, bark-strips, moss, caterpillars' webs, hair, etc., and lined with fine rootlets. *Eggs:* 4 or 5, usually 4; about .63 to .76 by .50 to .55 in.; indistinguishable from those of Yellow Palm Warbler. *Dates:* Said to nest in June in northern Canada.

Range. — Interior and eastern North America and Central America. Breeds in Canadian Zone from southern Mackenzie, northern Manitoba and northern Ontario south to northern Minnesota and (probably) central-southern Ontario; migrates largely southeastward but also west to eastern parts of North Dakota, South Dakota, Nebraska and Kansas; occurs regularly in migration on Atlantic slope of United States where most common on southern seaboard, but ranging north to Massachusetts, New Hampshire and New Brunswick; winters from southern Louisiana, southern Alabama and eastern South Carolina to Florida, Bahamas, all Greater Antilles, Swan Island, Island of Old Providence (Caribbean Sea) and Yucatan.

Distribution in New England. — Uncommon to rare fall migrant, except in Maine where not recorded; noted in winter coastwise in southeastern Massachusetts and Connecticut; no records of specimens taken in spring, but several reports of spring occurrence in southern New England, and one doubtful report from New Hampshire.

Season in Massachusetts. — (April and early May); September 7 to 28 (winter).

Haunts and Habits. The Palm Warbler is merely a race that in the breeding season occupies a region farther west than that inhabited by the Yellow Palm Warbler in the east. It is regarded as merely a fall migrant in New England, but I am confident that I have seen the bird in Massachusetts in early May and others have reported it in April or May; however, so far as I know, no specimen of the bird has been taken in New England in spring.

This is a hardy bird. We have records of its occurrence in winter in Massachusetts on December 2, 4, 7, 20 and 24 and January 2, 4, 7 and 10, and Mr. Cameron E. Wood reported about 100 Palm Warblers and Yellow Palm Warblers on the island of No Man's Land, Dukes County, during the winter of 1927–28, the larger part of which were of the former race. They were still there on March 18. This constitutes a spring record for the subspecies. It is interesting to note in this connection that Mr. Allan L. Moses reported to me that he saw a Palm Warbler on the island of Grand Manan, New Brunswick, on January 19, 1928 — his first record for the species there in winter.

Its habits while here are similar to those of the Yellow Palm Warbler, and it frequents the same lands, usually near swamps or along the shores of streams or bodies of water. It is seen mostly on low trees, bushes, or on the ground.

Little is known of the food of this bird. Feeding as it does near the ground, probably it takes more grasshoppers and locusts than some of the more arboreal warblers. Mr. A. H. Howell reports on the examination of fifteen stomachs of this warbler, from Alabama, that the food consisted of insects with a few spiders. Among the contents of these stomachs he lists weevils and other beetles, ants and other hymenoptera, bugs, caterpillars, grasshoppers and ephemerids. Mr. Howell also states that Mr. W. D. Doan reports finding house flies in the stomachs of the species, and that Mr. R. W. Williams, Jr., says he saw large numbers of these warblers feeding on cotton-worms on October 16, 1904, near Tallahassee, Florida.[1]

The capacity of this bird for the consumption of insects is shown by a letter from Mr. Robert H. Coleman to the Biological Survey. He counted the number of insects that one of these birds caught and found that it varied from 46 to 60 per minute. He writes "the bird spent at least four hours on our piazza, and in that time must have gathered about nine thousand five hundred insects."[2]

Economic Status. Probably this is one of the most useful warblers of the Mississippi Valley region.

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[1] Birds of Alabama, 1924, p. 308.

[2] Judd, Sylvester D.: United States Department of Agriculture, Division of Biological Survey, Bulletin No. 17, 1902, p. 104.

Dendroica palmarum hypochrýsea Ridgway. Yellow Palm Warbler.

Other name: YELLOW RED-POLL WARBLER.

Plate 85.

Description. — Similar to Palm Warbler (see page 270) with similar red cap, but larger, and much more brightly colored; more olive above; stripe over eye yellow, and *entirely yellow below* at all ages (except juvenal) and at all seasons; similarly streaked below, but streaks broader; in autumn and winter the yellow below more or less veiled with whitish, but much more extensive than in Palm Warbler. *Young in juvenal plumage:* Apparently indistinguishable from young of Palm Warbler.

Measurements. — Length 4.90 to 5.75 in.; spread 8.00 to 8.55; folded wing 2.14 to 2.80; tail 2.05 to 2.60; bill .44 to .52; tarsus .75 to .80. Female smaller than male.

Molts. — Similar to those of Black-throated Green Warbler (see page 264).

Field Marks. — Adults in spring are much like Palm Warbler above with chestnut cap, but *below yellow throughout including belly,* and *streak over eye yellow;* adults and young in fall, though less clear yellow below, are much more yellow when contrasted with Palm Warbler, which now has no pure yellow except on under tail-coverts. Like Palm Warbler, constantly wags tail up and down.

Voice. — Similar to that of Palm Warbler; calls, lisping notes or a *chip;* song similar to that of Palm Warbler, sometimes somewhat resembling that of Pine Warbler.

Breeding. — Similar to that of Palm Warbler; in bogs, bushy pastures, barrens and similar open lands, with shrubbery and a few large trees. *Nest:* On ground or very near it, in the moss or grass at foot of tree or bush, one nest a foot from ground on stunted spruce (O. W. Knight); composed largely of grass or rushes, and well lined with hair and feathers. *Eggs:* 4 or 5; .63 to .72 by .48 to .52 in.; ovate to short rounded ovate; buffy or creamy-white, spotted more or less with brown and lilac, often tending to form wreath round large end; figured by F. M. Chapman in "The Warblers of North America," Figs. 82, 83. *Dates:* May 27 to June 28, Maine; latter half of May, Nova Scotia. *Incubation:* Period 12 days (F. L. Burns); apparently by female. No reports of more than one brood yearly.

Range. — Atlantic and Gulf of Mexico regions of eastern North America. Breeds in Canadian Zone from southeastern Ontario, southern Quebec, southern Labrador and Newfoundland south to southern Maine, southern New Brunswick and southern Nova Scotia; winters from southern Louisiana, central Alabama and eastern North Carolina to southern Alabama and southern Florida and (casually) north to Pennsylvania and Massachusetts; accidental in Ohio, Cuba, Jamaica and Bermuda Islands.

Distribution in New England. — Common spring and less common fall migrant; breeding locally in Maine, chiefly in northern and eastern parts; winter resident coastwise in extreme southern New England in mild winters.

Season in Massachusetts. — (March 17, 28) April 2 to May 20; September 5 to October 26 (November 20) (winter).

Haunts and Habits. Mid-April has passed and there is still some snow in the deep woods, when walking by some bush-bordered waterside we see what might well be called "a little yellow wagtail." It has a red cap and an olive-gray back, but its lower plumage is practically all bright yellow. It flits from bush to ground, sometimes accompanied by several companions, or in a scattered group of Pine Warblers or Myrtle Warblers, with its loose-hung tail almost continually wagging "with methodic regularity," not from side to side like that of a dog, but up and down like that of a Phœbe, and with the same easy unhurried motion. This is the Yellow Palm Warbler.

As the late William Leon Dawson said of the Palm Warbler "in the careful husbandry of nature this bird alone of the wood-warbler kind has been assigned to a station unmistak-

ably humble." Other warblers inhabit low bushes, but perhaps no member of the genus *Dendroica* spends so much of its time on the ground as the two races of *D. palmarum*. The Yellow Palm Warbler often associates with sparrows in the field, where it scratches or hops about as they do, and is a typical bird of the undergrowth of thin open woods. Nevertheless it is no stranger to trees, though seldom ascending them to any great height from the ground, which is its favorite nesting place. In early spring it picks out the most likely places for the early development of insects, such as sunny sheltered shores of ponds and streams, or bushy swamps, or an old orchard on the south side of a hill, near water. In pursuit of its prey it flits from branch to branch, and often to the ground, and pursues and captures flying insects in the most active manner, though its ordinary movements, especially those of the tail, may seem rather indolent and lackadaisical.

It sings more or less during migration. Its common song is generally termed a trill, as its short notes are uttered rapidly. It is not very loud, but rather soft and sweet, resembling slightly the song of the Pine Warbler. It has another song also, and both have variations. I have never seen it on its breeding grounds, but an excellent account of its nesting haunts, nest and eggs was given by the late Ora W. Knight, who says in his "Birds of Maine" that the young remain in the nest about twelve days, and are cared for by both parents.

On the return south through New England in autumn, the Yellow Palm Warblers scatter about over fields, pastures and swamps, and often assemble where gray birch saplings are infested with plant-lice, of which they seem particularly fond. Thus they pass through in late September and early October, and a few stragglers continue to pass in November; occasionally some are reported in winter. I doubt if any are hardy enough to winter here successfully except in mild seasons. Nevertheless we have reports of this subspecies in every winter month, along the coast of Massachusetts.

The food of the Yellow Palm Warbler appears to consist almost entirely of insects and seeds. The seeds (unidentified) are eaten largely in the fall and winter. On Cape Cod it apparently eats bayberries in winter, like the Myrtle Warbler. Insects, which evidently form much the greater part of its food, are taken the year round. Among the insects are May-flies and other flies, gnats and mosquitoes, leaf beetles and other beetles, bugs, ants, plant-lice and grasshoppers.

Economic Status. Undoubtedly the Yellow Palm Warbler is more useful in the eastern United States and Canada than are most species, as it summers chiefly in Canada, migrating up and down the Atlantic slope, and at all seasons feeds principally upon insects.

Dendroica díscolor (Vieillot). Prairie Warbler.

Plate 85.

Description. — Similar in form to others of this genus; bill rather slender; tail slightly rounded. *Adult male in breeding plumage:* Above yellowish-olive-green, brighter on top of head and hind neck; feathers of back chestnut, edged olive-green, *thus back spotted with chestnut;* wings and tail dusky, edged

with olive-greenish; two yellowish wing-bars; three outer tail-feathers on each side with very large spaces of white, the outermost being largely white on both webs; large crescentic spot below eye, stripe above it and lower plumage yellow; streak through eye, crescentic streak on side of throat and broad streaks from sides of throat down sides and flanks, black; iris brown; bill, legs and feet dark olive-brown or very dark brown, bill above and legs and feet sometimes nearly black. *Adult male in winter plumage:* Similar to same in spring but chestnut spots on back more or less concealed. *Young male in first winter plumage:* Similar to adult male in winter plumage but with chestnut on back more concealed and streaks below narrower. *Adult female in breeding plumage:* Similar to adult spring male and sometimes almost exactly like it but usually chestnut spots on back indistinct or obsolete and colors duller; in late summer more grayish above and more whitish below. *Adult female in winter plumage:* Similar to same in spring but grayer on cheeks and back, and black markings less distinct. *Young female in first winter plumage:* Similar to adult female, but lacking chestnut on back, cheeks still grayer, and dark markings not black but dusky or even absent; somewhat browner above than young male in first winter. *Young in juvenal plumage:* Olive-greenish or olive-brown above, eyelids whitish; wings and tail much as in adult, but wing-bars buff; below varying from pale yellowish to whitish, shaded darker on throat, and slightly streaked or spotted with dusky on breast; "bill and feet pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 4.25 to 5.20 in.; spread 6.30 to 7.35; folded wing 2.00 to 2.40; tail 1.70 to 2.10; bill .42 to .50; tarsus .60 to .74. Female smaller than male.

Molts. — Virtually the same as those of Black-throated Green Warbler (see page 264); immature birds become as adults in their first breeding plumage after a partial prenuptial (spring) molt about the head.

Field Marks. — Smaller than Chipping Sparrow and more slender. *Adult male:* Yellowish-olive-green above with *chestnut spots on back*, two yellowish wing-bars, much white in spread tail, lower plumage and sides of head yellow, streaked on sides of head and sides of body with black. *Adult female:* Similar, but usually duller in color, with less chestnut on back; in autumn both sexes show less chestnut or none on back. *Young:* Similar to adults, chestnut on back not apparent and streaks below narrower or absent; juvenal birds are unstreaked and browner.

Voice. — Call note, a soft chirp, "*chip* or *chirr*" (N. S. Goss); song, "a series of six or seven quickly repeated *zees*, the next to the last one the highest" (F. M. Chapman); songs vary greatly but in the majority of cases the last note as high as the rest (F. A. Foster); "a succession of mellow whistling creaks, each note pitched higher than the preceding, and each gaining somewhat in intensity until the next to the last one is reached" (W. L. Dawson).

Breeding. — On dry, sandy or gravelly, rather open, bushy lands with scattering trees where pitch pines, shrub oaks and other dry-land vegetation grows, but often not far from lake or streams; rather barren lands seem to be preferred such as rocky bushy pastures with scattered Virginia junipers or dry sproutland. *Nest:* From 1 to 12 feet up but usually less than 4 feet from ground, well concealed in a bush such as barberry, wild rose, hazel, shrub oak, scrub pine, hickory, Virginia juniper, bayberry or holly or a sapling tree, usually in a fork in the top of a low shrub where there is a dense growth of leaves which conceal it; composed of plant-stems, soft strips of inner bark and other fibrous material, dry leaves, spiders' webs and cottony fibers which bind it together. Mr. A. A. Cross writes from Huntington, Massachusetts, that all the nests he has found were lined with bright golden-colored moss stems (*polytrichum*). In some localities the nest lining is plant-down and feathers; it is often a very handsome and well made nest. *Eggs:* 3 to 5; .55 to .69 by .45 to .52 in.; ovate to short rounded ovate; white to greenish-white, spotted with brown, lilac and purple or purplish-brown, sometimes wreathed more or less distinctly about large end; figured by E. A. Capen in "Oölogy of New England," Plate V, Fig. 1, and by F. M. Chapman in "The Warblers of North America," Figs. 84–86. *Dates:* May 16, North Carolina; May 13 to 29, Virginia; May 27 to June 25, Connecticut; May 28 to June 18, Massachusetts. *Incubation:* Apparently about 14 days; by female. One brood yearly.

Range. — Eastern and central United States and West Indies. Breeds chiefly in Upper Austral

and Lower Austral zones from northeastern Nebraska, south-central Iowa, northern Illinois, central Michigan, northern Ohio, central New York and southern New Hampshire south to northeastern Texas, southern Arkansas, northern Mississippi, southern Alabama and southern Florida; recorded north locally to Wisconsin, northern Michigan, southeastern Ontario and Vermont; breeds but locally in Gulf States; winters from northern Florida through Bahamas south to the West Indian islands of Martinique, Porto Rico, Santo Domingo and Jamaica and to Mujeres and Cozumel islands (Yucatan) and Bonacca Island (Honduras); accidental in Bermuda Islands.

Distribution in New England. — Common but rather local summer resident in southern New England. *Maine:* Not recorded. *New Hampshire:* Rare local summer resident in southern part. *Vermont:* Casual summer visitor. *Massachusetts:* Common local summer resident, most common near coast, accidental there in winter. *Rhode Island:* Common local summer resident. *Connecticut:* Common summer resident in southern part, less common and more local elsewhere.

Season in Massachusetts. — May 1 to September 29 (January 2, 3).

Haunts and Habits. The handsome little Prairie Warbler is remarkable only for its song. Dr. Elliott Coues likens this to the "plaint of a mouse with the toothache," because of its thin wiry quality. Its ascending series of whistling creaks when once well heard and memorized is not likely to be mistaken for that of any other of the warble tribe.

The bird is not, as its name indicates, an inhabitant of grassy plains. Never was bird more ineptly named. We find the Prairie Warbler mostly on dry brush-covered lands, amid the scrub, upon the barrens, in stony, rolling, bushy pastures and fields, and even in the bushy borders of woodlands. Such localities in Massachusetts as the dry, sandy, burned-over lands in the interior of Cape Cod, overgrown with bushes, shrub oaks and scattering pitch pines, or such rocky pastures as the Salem Great Pastures, are the chosen haunts of this pretty warbler. On these lands, or on such bushy tracts as are frequented by the Chestnut-sided Warbler, it builds its nest. It is a clannish little fowl, and often assembles in small colonies to breed in its favorite localities. It is seldom seen about cultivated lands or grassy fields, or in deep woods.

Although it breeds occasionally in colonies, the nests are widely scattered, and each male seems to patrol a certain small territory to which he lays claim, and where he is always ready to give battle to any rival who encroaches on his section; but if danger in the shape of some enemy threatens the family of any one of them, the entire colony soon joins in protesting the invasion or threatening the invader. Usually they are somewhat deep and secretive, but they are consumed with curiosity, and if a visitor sits down quietly or conceals himself in a colony, most of the birds in it will be inquisitive enough to come prying about him.

While the female is setting on her eggs the male wanders from bush to bush and tree to tree, often stopping to sing with lowered tail and upraised head, as if praising his Creator, but rarely going very far away from his patient mate. Both parents feed the young and care for them for some time after they have left the nest. In July they wander about, often in berry pastures, and some of them begin their southward journey during that month. Others go in August and by September few remain in the north though stragglers may be seen even later.

Little is known of the food of the Prairie Warbler in New England except that it takes quantities of plant-lice but Dr. Alexander Wetmore, in his "Birds of Porto Rico," gives the following tabulation of the food percentages of 15 specimens, the stomachs of which have been examined at the Biological Survey: animal matter, 100 per cent; hemiptera, 43.78; coleoptera, 16.00; lepidoptera, 12.70; hymenoptera, 3.82; diptera, .35; spiders, 19.59; miscellaneous, 3.76.[1] At times, as in the case of most small birds, grasshoppers and locusts form a large part of its food.

Economic Status. See page 197.

Seiúrus aurocapíllus (Linnæus). Oven-bird.

Other names: GOLDEN-CROWNED THRUSH; TEACHER-BIRD; ACCENTOR.

Plate 85.

Description. — Larger than any of the foregoing warblers; bill rather short, bristles about its base very short and sparse; wings much longer than nearly even tail; long copious under tail-coverts; legs slender. *Adults (sexes alike)*: Top of head ochraceous-buff or brownish-orange, a broad middle stripe of this extending from base of bill to nape, its feathers inconspicuously tipped with olive, this stripe bordered on each side by a narrow black stripe; rest of upper plumage, including wings and tail, olive-green or brownish-olive-green, paling somewhat on sides of head and neck; ring around eye white; no white markings on wings or tail, but tips of outer tail-feathers sometimes narrowly paler; below, white, heavily spotted and streaked with blackish-brown on upper breast, sides and flanks, and line of same on each side of throat from lower base of bill; flanks tinged slightly with olive-green; wing linings chiefly gray; bill dusky above, pale below; iris brown; legs and feet pale flesh-color; female sometimes has crown-stripe paler than in male, with wider brown feather-margins. *Young in first winter plumage:* Virtually indistinguishable from their parents, the streaks below and the crown-stripe sometimes lighter. *Young in juvenal plumage:* Chiefly cinnamon-brown above, feathers slightly darker about shafts and sparingly spotted with olive-brown; wings and tail about as in adults; washed paler below than above, becoming white on abdomen and on tail-coverts; spotted on sides of chin and on breast and sides with olive-brown; crown not striped; "bill and feet pale pinkish-buff, becoming very little darker when older" (J. Dwight).

Measurements. — Length 5.40 to 6.50 in.; spread 8.75 to 10.40; folded wing 2.75 to 3.35; tail 2.00 to 2.50; bill .52 to .60; tarsus .70 to .92. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (late June, July), involving body plumage, wing-coverts and in some cases tertials; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (July); adults have but one annual molt (postnuptial), and acquire breeding plumage by wear.

Field Marks. — Size near that of Song Sparrow, or larger, but tail shorter. A bright olive-green bird with broad, black-margined, tawny-ochraceous or brownish-orange stripe over whole top and back of head; below white, streaked on sides of throat, upper breast and sides with blackish. Very young birds just from the nest are brown above and lack stripes on top of head. Walks much on ground, jetting its tail more or less, but not so continually as Palm Warbler or Water-Thrush.

Voice. — Call note a weak *cheep;* alarm note a loud *chick* or *chuck;* usual song, *cher, tea-cher, tea-cher, tea-cher, tea-cher,* becoming louder with each repetition (Witmer Stone); or *teacher, teacher, teacher, teacher, teacher* (John Burroughs); or *teacher, teacher, teacher, teach, teach, teach* (O. W. Knight); this song has several variations; also a flight-song given chiefly near sunset or in the twilight, and described below under *Haunts and Habits.*

[1] Wetmore, Alexander: Birds of Porto Rico, United States Department of Agriculture, Bulletin No. 326, 1916, p. 102.

Breeding. — Usually in deciduous or mixed woods, but often among pines. *Nest:* A bulky structure on dry ground on a slope, or on the level, occasionally in a swampy place, usually sunken somewhat, roofed over with an arch like that of a brick oven, and covered and concealed by dead leaves of the forest floor; entrance at one side, also often concealed by overhanging plants or leaves of shrubs; sometimes unroofed and open, but entirely concealed by overgrowing vegetation; built of grass or sedges, bark-strips, dry leaves, etc., lined with hair, fine grasses or pine needles. *Eggs:* 3 to 6; .68 to .90 by .52 to .70 in.; rounded ovate to short rounded ovate; white to creamy-white or pinkish-white, spotted with reddish-brown and lilac, usually finely spotted, but sometimes with confluent blotches near large end or wreathed about it; figured by E. A. Capen in "Oölogy of New England," Plate V, Figs. 4, 5, and by F. M. Chapman in "The Warblers of North America," Figs. 87, 88. *Dates:* May 15 to June 29, Pennsylvania; May 20 to July 10, Connecticut; May 17 to July 8, Massachusetts; May 30 to June 10 (July 29), Maine. *Incubation:* Period 12 days (F. L. Burns); by female chiefly or wholly. One brood yearly, probably two in some cases.

Range. — Most of North America north almost to tree limit and south to northern South America. Breeds in Hudsonian Zone, but chiefly in Canadian, Transition and Upper Austral zones from northwestern Alaska, northwestern Mackenzie, northern Ontario and central Quebec south to southeastern Oklahoma, central-western Arkansas, northern Alabama, northern Georgia, northwestern South Carolina and southeastern North Carolina (also probably in the Bahama Islands) and west to central Alberta, eastern Montana, eastern Wyoming and (casually) to Colorado; winters from southern Louisiana, Florida and South Carolina through the Bahamas and West Indies to Jamaica and Martinique, Swan Island and Island of Old Providence (Caribbean Sea) and from Nuevo Leon, Sinaloa and Oaxaca (southern Mexico), through Central America to Panama and Colombia; accidental in Greenland, Vancouver Island (British Columbia), California and Bermuda.

Distribution in New England. — Common migrant and summer resident throughout the region up to elevation of about 3,000 feet.

Season in Massachusetts. — April 28 to October 6 (November 3, 26, 27).

Haunts and Habits. The Oven-bird was one of the first birds to attract my attention when in May dawns I first began to wend my way to the shades of the wonderful leafy woods. Then all the wood-birds were new. It was as if they had just been created and loosed in those dim sequestered shades for my edification and delight. Among them all, the most common and conspicuous was the Oven-bird. Its *staccato* song with its *crescendo* ending rang through the woods, seemingly the loudest of them all, and when I saw the pretty bird walking with its alert air along a log, putting its little head forward at each dainty step in the manner of a diminutive chicken, I was utterly captivated. One sunny day as I trod a woodland path a tiny bright object, glistening like a dewdrop flashing in the sunlight, caught my eye; pausing to examine it, I saw that a sun ray was reflected from the eye of a bird sitting upon her nest. She sat there until almost trodden upon, and then fluttered out and trailed pitifully away like a cripple with a broken wing, but I had guessed her secret and, parting the leaves, looked into her cunningly concealed nest and saw for the first time the pretty speckled eggs.

Many moons passed and my knowledge of the notes and calls of the bird seemed to be complete, but I had still much to learn. One evening when I had lingered in the loved woods until twilight came, I heard in the air a wild outburst of intricate rapturous melody ascending far above the tree-tops, and saw the little singer rising against the glow of the western sky, pouring out his passion song to the slowly rising moon. When the song

was done and the exhausted singer fell from out the sky, his final notes were those of the common song of my little friend, the Oven-bird, who at the end shot down with wings nearly closed and dropped to earth almost at my very feet. Many times thereafter I heard this song, with its accompanying variable flight, which years later was hailed as a new discovery by John Burroughs. Probably every field ornithologist had heard it, but Burroughs was the first to describe it *at length*. Nuttall speaks of the night song and Brewer mentions it. Thoreau speaks often of this mysterious "night warbler," but apparently never identified it. His anxiety to know the source of the night melody was so great that Emerson warned him to cease trying to find out what it was lest he should succeed and "thereafter lose all interest in life." [1] Samuels also heard and described the flight-song briefly when I was still a small child.[2] It is, as Dr. Chapman says, "a wild outpouring of jumbled notes over which the bird seems to have no control, and is often concluded with the common *teachér* song."

Although its flight-song is usually uttered at dusk on moonlit nights, it is given occasionally in the daytime or just before daylight, and sometimes from a perch. Gerald Thayer describes a carol which was warbled by the bird when quietly perching, and consisted of the slightly subdued flight-song, rapidly repeated, followed by a dash through the woods, during which the song was continued until the bird passed out of hearing. In three minutes of singing the bird had repeated its complete flight-song more than thirty times. Variations of the ordinary song are given occasionally, and individuals seem to have peculiar songs of their own, some of which are well described by Mr. Thayer, who is quoted by Dr. Chapman.[3] Usually the "teacher" song is uttered from the ground, from a prostrate log or from a low branch of a tree; as I have heard it commonly, it might be rendered as *cher-téa cher-téa*, etc., but sometimes *téacher* or *teachér*, etc.

The Oven-bird most commonly inhabits dry deciduous or mixed woods, but it is sometimes found in white pine or spruce groves and often in rather low swampy ground. Like its congeners, the water-thrushes, it walks and runs much upon the ground, but keeps mostly out of the water (although fond of bathing) and does not, like them, habitually wave its tail up and down, though the tail is jetted or waved more or less, in the manner of the Hermit Thrush. Often it is held rather high with wings drooping below it, as the bird steps daintily along on its pretty pink feet.

Our little woodland songster usually arrives in Massachusetts during the first ten days of May, and when the females come, courtship soon begins. The male, now all ardor and animation, flies and dashes about the female, hops, struts and postures, raising tail and crest, lowering wings and singing with great vigor and abandon. Sometimes he flutters up into the air and shows his devotion by revolving in flight about the demure and retiring female. If rivals appear there is much swift chasing through the air, and withal numerous outbursts of song. When the happy pair is finally united, nest building begins.

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[1] Gladden, George: Nature Lovers Library, Birds of America, T. Gilbert Pearson, editor, Vol. III, 1917, p. 153.
[2] Samuels, E. A.: Birds of New England, 1870, p. 219.
[3] Chapman, Frank M.: The Warblers of North America, 1907, pp. 223, 224.

Both birds labor lovingly together, burrowing into the forest floor to round out an aperture for their lowly nest, which often is completed in fair weather in two or three days. As soon as the newly hatched young are ready for food, both parents begin to feed them. They are cared for not only in the nest but until they are able to fly strongly and feed themselves.

When the female is startled from the nest, she drags herself along the ground fluttering as if sorely wounded, in an effort to lead her disturber away from her home. However, as in the case of many other ground-nesting birds, frequently the first brood is destroyed by enemies, and it is difficult to get accurate information regarding the actual rearing of two broods in one year.

Most of the insects with which the young birds are fed are taken from the ground, but they also take some from the shrubbery and from the lower parts of trees, and they sometimes pursue flying insects and capture them in the air. Sometimes in July, August or September small numbers of Oven-birds frequent white pine woods, where they seem to find food, for they visit even the upper branches. When in migration they are usually silent and rather furtive.

It seems probable that this species has a second brood, for its common song gradually ceases during the care of the young, but the flight-song is sometimes heard until late in July. There is another song period in August, and individual birds have been heard singing full songs all through that month.

During August many Oven-birds wander about with small flocks of other warblers — with the tree warblers but not of them — for although they may keep near the more arboreal birds, they rarely mix with them in the trees, but stay mostly on or near the ground. Early in September most of the local breeding birds are on their southward way. During migration they are seen occasionally in parks and in the shrubbery of gardens in village or city.

This little wood-bird manifests much interest in what is going on about him and curiosity seems to dominate his actions. If we imitate his call or the cry of a wounded bird, we may soon see three or four Oven-birds hastening toward the sound. If we sit quietly down on a log in the woods, one or more of these prying little creatures may soon appear, to inspect the novelty.

The food of the Oven-bird consists largely of insects, small snails, slugs, myriapods, earthworms and spiders, together with some wild fruit and seeds. Among the immense number of insects taken are many plant-lice, caterpillars, both hairy and hairless, including those of the gipsy moth, other larvæ, moths, butterflies, grasshoppers, crickets, weevils, click-beetles, leaf-beetles and other beetles, ants, flies, bugs, etc., but no thorough examination of its food has been published.

Economic Status. The character of the food of this species, so far as known, indicates that it may be one of our most useful forest birds. It "does no harm, while it constantly aids in keeping down the numbers of woodland insects" (W. L. McAtee).

Seiurus noveboracénsis noveboracensis (Gmelin). Water-Thrush.

Other names: NORTHERN WATER-THRUSH; WATER WAGTAIL.

Plate 85.

Description. — Formed much like Oven-bird, but more slender and bill smaller; short bristles around mouth; tail-coverts long and copious. *Adults (sexes alike)*: Above including wings and tail, plain rather dark olive or olive-brown; broad buffy stripe over eye from bill to neck; side of head chiefly dusky-olive; lower eyelid white or whitish; side of lower jaw and under plumage pale greenish-yellow or buffy-yellowish; upper breast, sides and flanks streaked with very dark sooty-olive, usually some spots or flecks of same on throat; wing linings pale grayish-olive-brown; bill brown, lighter below, especially in winter; iris brown; legs and feet flesh-color. *Young in first winter plumage (sexes alike)*: Virtually indistinguishable from adults, but average a little more reddish above. *Young in juvenal plumage:* Somewhat similar to young in first winter plumage, but each body feather has a bar of dusky and is tipped with cinnamon or buff, producing an irregularly barred or mottled appearance; streaks below less sharply defined than in adults; middle and greater wing-coverts edged cinnamon or buff forming two buffy wing-bars.

Measurements. — Length 5.00 to 6.15 in.; spread 8.50 to 10.03; folded wing 2.70 to 3.12; tail 1.90 to 2.40; bill .54 to .64; tarsus .80 to .86. Female smaller than male.

Molts. — Similar to those of Oven-bird (see page 276) but apparently the postjuvenal molt does not include any tertials.

Field Marks. — Size near that of Song Sparrow, but more slender, though tail shorter; above, dark olive-brown with light stripe over eye, *buff in strong light;* below, buffy-yellow or greenish-yellow, spotted and streaked with very dark olive. Usually found on or near the ground and near water, often wading in shallows, tipping body and waving tail constantly up and down. Distinguished from Louisiana Water-Thrush by buffy stripe over eye and yellow or yellowish lower plumage, where that bird is nearly white.

Voice. — Alarm note a sharp, steely *clink* (F. M. Chapman), like that of the Prothonotary Warbler; call note a loud ringing *chip;* song "a ringing, bubbling warble, swift and emphatic, made up of two parts, barely divided, the second lower toned and *diminuendo*" (G. H. Thayer); "*ching-ching-ching, chee-chee-chee, ch-ch-ch-ch*" (J. B. May); also a quicker and longer flight-song.

Breeding. — In wooded swamps and bogs, along wooded water courses, particularly along large brooks flowing through the woods or along the low and swampy wooded shores of some body of water. *Nest:* In cavity of ground or among roots of prostrate tree, at base of moss-covered stump, under mossy log or in side of mossy brook bank; composed chiefly of green moss externally like that with which it is usually surrounded, and lined with blossom stems of same moss; bits of leaves, grass, rootlets, twigs, etc., often form a part of it. *Eggs:* Usually 4 or 5; .75 to .87 by .56 to .69 in.; ovate to rounded ovate; flesh-color to creamy-white or pinkish-white, marked all over with spots, and sometimes with dashes and scrawls of various shades of brown (reddish-brown often predominating) and lavender-gray, often with a tendency to form wreath about large end; figured by E. A. Capen in "Oölogy of New England," Plate V, Figs. 6, 7, and by F. M. Chapman in "The Warblers of North America," Figs. 89–91. *Dates:* May 21 to June 15, Massachusetts; May 28 to June 9, Maine. *Incubation:* Period about 14 days; by female. One brood yearly.

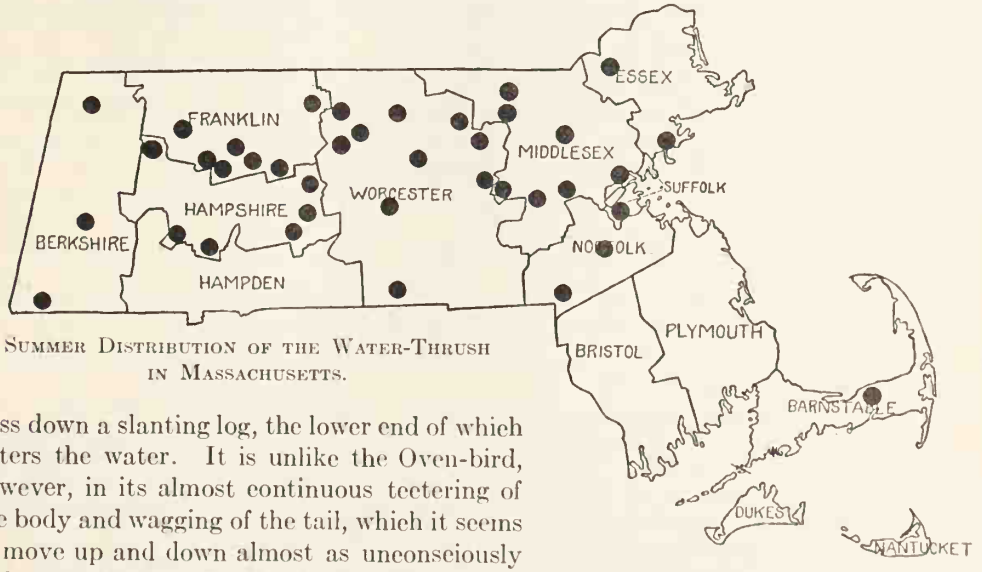
Range. — Eastern North America to northern South America. Breeds in Hudsonian, Canadian and Transition zones from northeastern Ontario, central Quebec (southern Ungava), central Labrador and Newfoundland south to southern Wisconsin, southern Michigan, southwestern Ontario, West Virginia, central-eastern Pennsylvania and Rhode Island; in migration occurs west to Minnesota and central Texas; winters from valley of Mexico through Central America to Ecuador, southern Venezuela and British Guiana and from central Florida, the Bermuda Islands and Bahamas throughout West

Indies to Tobago and Trinidad, also to Swan Island and Island of Old Providence (Caribbean Sea); accidental in Greenland.

Distribution in New England. — *Maine:* Common migrant; in eastern and northern Maine a less common summer resident. *New Hampshire:* Common migrant; less common summer resident in northern part, becoming local south of White Mountains. *Vermont:* Common migrant; less common local summer resident, nests sparingly in Canadian faunal region. *Massachusetts:* Common migrant; rare local summer resident, chiefly in northern and western parts. *Rhode Island:* Common migrant; very rare local summer resident. *Connecticut:* Common migrant; not known to breed.

Season in Massachusetts. — (April 17, 25) May 2 to June 5 (summer); August 1 to October 16.

Haunts and Habits. Though not really a thrush, the Water-Thrush is well named. It is a large wood warbler disguised as a thrush and exhibiting an extreme fondness for water. Like the Oven-bird it walks, and seems fond of walking on a log, but prefers to pass down a slanting log, the lower end of which enters the water. It is unlike the Oven-bird, however, in its almost continuous teetering of the body and wagging of the tail, which it seems to move up and down almost as unconsciously and regularly as it draws the breath of life; this action is accompanied by a springy motion of the legs. It is so fond of the water that it is never seen far from it, except when, in the exigencies of migration and in search of food, it may alight and feed for a time away from its beloved element. Thus, in the fall migration, it occasionally visits gardens, the trees and shrubbery about buildings, and groves at some distance from water. But in spring and summer it usually may be found along woodland brooks, in dark and shaded swamps and bogs, or along the low and swampy wooded shores of lakes and rivers. It delights to wade in shallow waters much after the manner of the sandpipers, but is much more retiring than they, and at the first real alarm it seeks cover. Although its activities are largely terrestrial or even aquatic, it is at home amid the tree-tops as well.



Summer Distribution of the Water-Thrush in Massachusetts.

The Water-Thrush usually becomes common in its chosen haunts in Massachusetts by the second or third week in May, and again in early September. In summer pairs are

scattered sparingly over the northern and western parts of the state, but because of their scarcity at this season, their shyness and the care with which they conceal their nests, records of actual breeding within our limits are rather rare.

The ordinary song of this bird, ringing through a dark, shaded swamp, is so loud as to be somewhat startling. It is wild, ringing and melodious, exceeding in power that of the Winter Wren, and occasionally when the passionate creature rises above its lowly habitat in its flight-song, it eclipses all its mundane efforts in a burst of enraptured music which is heard only in the retired precincts of its breeding haunts. In northern New England the song mingles with the murmur and splashing of cool waters or wells up from leafy swales.

When the young have left the nest they may be found with their parents about the shores of ponds, along streams, or in bushy hollows until the latter part of August, when the southern migration begins.

The food of the Water-Thrush consists more or less of aquatic insects, beetles and their larvæ, and moths. It picks up dead and soggy leaves from crevices in the rocks and throws them aside, thus uncovering lurking creatures on which it feeds. According to Dr. Elliott Coues tiny molluscs and crustaceans are eaten, and Mr. Arthur T. Wayne took one that had eaten a few small minnows. Dr. B. H. Warren names small worms as one constituent of its food, and it also eats quantities of mosquitoes.

Economic Status. So little is known regarding the food of this bird that nothing definite can be said regarding its utility; apparently it is harmless.

Seiurus noveboracensis notábilis Ridgway. Grinnell's Water-Thrush.

Description. — Similar to Water-Thrush but averaging larger, bill larger and longer; darker, less olive (more sooty and grayish) above; stripe over eye and lower plumage yellowish-white. *Young in juvenal plumage:* Darker than young of Water-Thrush; body-feathers dusky with buffy tips; wing linings grayer and paler than back; bill black, pink below; legs and feet pink.

Measurements. — Length 5.50 to 6.50 in.; spread 9.40 to 10.20; folded wing 2.90 to 3.25; tail 2.10 to 2.50; bill .55 to .65; tarsus .77 to .85. Female smaller than male.

Molts. — Similar to those of Water-Thrush (see page 280).

Field Marks. — I have never knowingly seen this bird alive, but as it varies more or less, especially in color of lower plumage, it must be virtually impossible to distinguish it in the field, as some individuals resemble the Water-Thrush and others, less closely, the Louisiana Water-Thrush. Typical birds are darker above than Water-Thrush and whiter below and over eye, thus approaching in color Louisiana Water-Thrush, while the latter has fewer or no marks on its white throat.

Voice. — Call, a loud, sharp, steely, bell-like *clink;* song, a high-pitched, loud, clear, swift, emphatic, bubbling, ringing, musical warbled whistle, *sweet sweet sweet chu-chu-wee-chu,* or *quit-quit-quit-que-quewe-u,* the next to the last note of the run being higher than the others; flight-song a hurried jumbled mixture of song and call notes while the bird flies through or over the woods (G. F. Simmons). Notes and song evidently resemble those of eastern Water-Thrush.

Breeding. — Breeding habits, nest, eggs and incubation similar to those of Water-Thrush, but it ranges farther north, even beyond tree limit in Alaska.

Range. — Western and central North America to northern South America. Breeds mostly in Hudsonian and Canadian zones from tree limit in northeastern Siberia (East Cape), northwestern Alaska, northern Yukon, northwestern and central Mackenzie, northern Manitoba and northwestern Ontario south to southern British Columbia, northern Idaho, southern Montana, northwestern Nebraska, central Iowa (casually) and northwestern Michigan; south in migration chiefly through Mississippi Valley, but also east to Atlantic coast from New Hampshire southward and west to California and New Mexico; winters from central Florida and Bahamas to Porto Rico, Cuba, and to Island of Old Providence (Caribbean Sea), and from southern Lower California and central Texas through Mexico and Central America to Colombia and Ecuador; apparently only casual in Wyoming, Colorado, Utah, Arizona and Washington.

Distribution in New England. — Rare migrant, taken only in New Hampshire, Massachusetts and Connecticut. Records: *New Hampshire:* Tamworth, May 20, 1890, male taken by Frank Bolles, now in collection of Museum of Comparative Zoölogy of Harvard University. *Massachusetts:* Wayland, August 11, 1879, female in collection of E. A. and Outram Bangs, now in Museum of Comparative Zoölogy of Harvard University. *Connecticut:* Hampden, September 7, 1904, young female, East Haven, September 21, 1904, young male, Orange, May 20, 1905, adult male, New Haven, August 25 and September 7, 1906, all the above taken by Dr. L. B. Bishop; Branford, August 29, 1907, one found dead by Dr. L. C. Sanford. All the Connecticut records in collection of Dr. L. B. Bishop.

Haunts and Habits. The haunts, habits and food of this race are similar to those of the eastern Water-Thrush. Dr. Coues describes both in his inimitable manner as follows:

"Should you force your way, — perhaps by paddling in a light canoe beneath the overhanging mysteries of the dank morass, — perhaps by clambering among the fallen logs that jut from treacherous black depths of ooze and slime — you may even catch a glimpse of this coy songster as he dashes onward into yet more secret fastness of his watery and seldom sun-lit home. His song is still now; silence broods, or else a sharp short note of anger and anxiety betrays the presence of the timid bird, too restless and too nervous in his vague alarm to hide in safety, but rather dallying with danger as he leaps and balances on log, moss-heap, or branchlet. But this is only when he feels the cares and full responsibilities of home and family. Later in the season, when these things are off his mind, he is quite another fellow, who will meet you more than half-way should you chance to find him then, with a wondering, perhaps, yet with a confident and quite familiar, air of easy unconcern. Anywhere by the water's edge — in the *débris* of the wide-stretched river-bottom, in the flowery tangle of the brook, around the margins of the little pools that dot the surface where tall oaks and hickories make pleasant shade — there rambles the Water-Thrush. Watch him now, and see how prettily he walks, rustling among the fallen leaves where he threads his way like a mouse, or wading even up to his knees in the shallow miniature lakes, like a Sandpiper by the sea-shore, all intent in quest of the aquatic insects, worms, and tiny molluscs and crustaceans that form his varied food. But as he rambles on in this gliding course, the mincing steps are constantly arrested, and the dainty stroller poises in a curious way to see-saw on his legs, quite like a Titlark or a Spotted Sandpiper. All of his genus share this gait, quite different from the hopping movement with which the *Sylvicolidæ* in general progress — but see!

he catches sight of us, and quite breaks off the thread of such reflections as he casts his bright brown eye upon us with a coquettish turning sideways of the head. Let the pretty picture be — we leave him to resume in peace his morning's walk, bidding godspeed." [1]

Seiurus motacilla (Vieillot). Louisiana Water-Thrush.

Other names: LARGE-BILLED WATER-THRUSH; SOUTHERN WATER-THRUSH; WATER WAGTAIL.

Plate 85.

Description. — Similar to the two preceding water-thrushes, but averages larger than either; bill larger and longer. *Adults (sexes alike)*: Above plain grayish-olive or olive-brown, slightly darker on crown; conspicuous long, broad, white stripe over eye; whitish or buffy white below, growing more tawny on flanks and under tail-coverts; throat unspotted, or only very slightly marked with minute flecks; sides and flanks with broad streaks of same color as back; bill brownish, darkening at tip, paler below; iris brown; legs and feet pale flesh-color. *Young in juvenal plumage:* Differs from young of other water-thrushes by being deep olive-brown above without buffy or cinnamon feather-tips except two light wing-bars, and by having *conspicuous white stripe* over and behind eye.

Measurements. — Length 5.75 to 6.40 in.; spread 9.75 to 10.75; folded wing 2.80 to 3.26; tail 2.05 to 2.40; bill .53 to .62; tarsus .73 to .91. Female smaller than male.

Molts. — Similar to those of Northern Water-Thrush (see page 280).

Field Marks. — Near size of Song Sparrow but tail shorter; the largest of our water-thrushes; rather dark olive-brown above; *conspicuous long broad stripe over eye pure white;* below white tinged slightly buffy in strong light; throat nearly always unspotted; white below where Water-Thrush is yellow. Inhabits moist wooded places near water. Pipits, which might be confused with water-thrushes because of similar tail-wagging, inhabit open lands.

Voice. — Call like that of Water-Thrush; song like that of Water-Thrush, quite as loud or louder and very variable in number of syllables, as well as in excellence of delivery; a short song, *pseur, pseur per sée ser* (William Brewster).

Breeding. — Usually in the wooded valley of a rocky brook or small stream, sometimes in a swamp. *Nest:* Commonly in an excavation in a brook bank, occasionally among upturned roots of fallen tree near water; bulky and composed largely of grass, dry leaves, rootlets and moss. *Eggs:* 4 to 7, usually 5; .72 to .90 by .58 to .70 in.; resembling those of Oven-bird, but more rounded and more glossy and polished; rounded ovate to short rounded ovate; white, very variably marked with many shades of brown and lilac-gray, with some obscure lavender markings; figured by E. A. Capen in "Oölogy of New England," Plate V, Fig. 8, and by F. M. Chapman in "The Warblers of North America," Figs. 92–94. *Dates:* May 1, Virginia; May 6 to July 1, New York; May 6 to June 12, Connecticut; May 15 to May 28, Rhode Island. *Incubation:* Period 12 to 14 days; chiefly or wholly by female (J. B. Canfield).

Range. — Eastern and central United States and southern Ontario to northern South America. Breeds mainly in Upper Austral Zone from central-eastern Nebraska, southeastern Minnesota, southern Wisconsin, southern Michigan, southeastern Ontario, central New York, southern Vermont and Massachusetts (accidental in Maine) south to northeastern Texas, central Louisiana, southern Alabama, northern Georgia, central South Carolina and eastern North Carolina; winters from southern Tamaulipas, southern Nuevo Leon and Sinaloa south through Central America to Colombia and from central Florida (casually) through the West Indies to Antigua, Porto Rico, Jamaica and Island of Old Providence (Caribbean Sea); casual in migration to the Bahama Islands; accidental in southern California.

Distribution in New England. — An uncommon to rare summer resident in southern part, acci-

[1] Coues, Elliott: Birds of the Colorado Valley, 1878, p. 307.

Photograph by Daniel D. McDavid

FIG. 82. — NEST AND EGGS OF LOUISIANA WATER-THRUSH

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Photograph by Miss Cordelia J. Stanwood

FIG. 83. — REDSTART, FEMALE, NEST AND YOUNG

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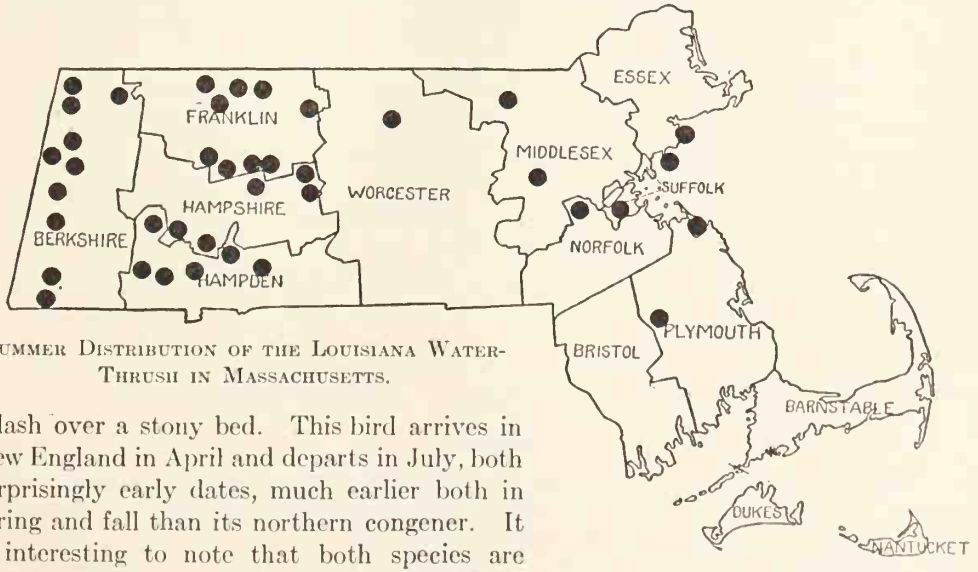
dental elsewhere. Records: *Maine:* Norway, 1865, specimen taken by Irving Frost.[1] (The record made near Waterville by Professor Hamlin has been withdrawn.) *New Hampshire:* Dublin, August 19, 1901, bird seen by G. H. Thayer;[2] Jaffrey, May 29, 1920, Miss Lucia B. Cutter wrote that one came twice to her piazza, where it seemed to be feeding on spiders' eggs or young spiders; May 30, 1923, one seen by Miss Nina Spaulding; these observers were positive of their identifications, but ornithologists may not accept any of them as a first record for the state, as they have not that element of certainty that pertains to a specimen actually taken. *Vermont:* Brattleboro, birds seen several different years by Mrs. E. B. Davenport, identity verified again and again by distinctive markings; Guilford, about 1914, Mrs. Davenport also has a record of a pair nesting and feeding young at Glen Brook in Guilford, south of Brattleboro and not far from the Massachusetts line.[3] The species has been found in the breeding season in Massachusetts nearly to the Vermont line, but what was said before regarding the acceptance of the New Hampshire records will also apply here. *Massachusetts:* Rare visitor and summer resident mostly in western half. *Rhode Island:* Rare summer resident. *Connecticut:* Uncommon summer resident, generally more common near southern coast.

Season in Massachusetts. — April 13 to July 28 (November 8, 9).

Haunts and Habits. The haunts of the Louisiana Water-Thrush in Massachusetts are even wilder and more retired perhaps than those of its northern relative. It is fond of rocky glens in deep woodland shades, where the rushing waters of a brook tumble and



Summer Distribution of the Louisiana Water-Thrush in Massachusetts.

splash over a stony bed. This bird arrives in New England in April and departs in July, both surprisingly early dates, much earlier both in spring and fall than its northern congener. It is interesting to note that both species are found in the same localities in western Massachusetts, across the entire state, where their respective ranges overlap, and Mr. Harry S. Hathaway tells me that he has found both species breeding in the Kingston swamp in Rhode Island.

[1] Stearns, W. A., and Coues, Elliott: New England Bird Life, 1881, Part 1, p. 159.

[2] Allen, G. M.: A List of the Birds of New Hampshire, Proceedings Manchester Institute of Arts and Sciences, Vol. IV, 1902, p. 168.

[3] Vermont Bird Club, Bulletin No. 2, 1907, p. 12; Davis, Miss Bertha E.: *in litt.*

As a songster the Louisiana Water-Thrush is nearly or quite the equal of the northern bird. Some ornithologists, having heard both, regard it as superior to the other, but perhaps they have heard particularly gifted individuals. Often it is so difficult to get a fair view of the bird that though its wild ringing song may be readily followed through the shrubbery and tangles in which it delights, the would-be observer is puzzled regarding which species he is following. Fleeting glances of a teetering bird, or a flitting form darting low and fast through the undergrowth are all that may be vouchsafed the vexed pursuer.

The bird seems usually even more shy than the Water-Thrush. Indeed, Mr. Arthur T. Wayne, writing of South Carolina, says that he knows of no bird of its size so difficult to approach. He writes that he wore out a suit of clothes in pursuing one through a dense swamp during an entire week but failed in his attempt to collect the bird. Nevertheless, when this bird has young in the nest or fledglings that have recently left the nest, it forgets its caution when a human intruder seems to menace their safety. The female, though shy, sits very closely on her nest, and will allow a hand to be placed almost on her back sometimes before she will desert her charge. She seems to be aware that as long as she keeps still she is well concealed. A pair that I watched while they were feeding newly fledged young seemed to care little for their own safety when their young appeared to be in danger.

Mr. W. Lindsay Foxhall says that when the bird is surprised on the nest it will tumble out of it and into the water in the most surprising and startling manner, and then it will flutter and roll over and over for several yards down stream, as if its head were severed from its body.[1]

The food of the Louisiana Water-Thrush evidently is similar to that of the northern species, but little is known of its exact character.

Economic Status. The bird appears to be harmless and useful, but no definite statement can be made.

Oporórnis formósus (Wilson). Kentucky Warbler.

Plate 86.

Description. — A typieal ground warbler in form, but bill rather straight and slender; bristles about mouth very weak, barely obvious; no white in wings or tail, except narrow whitish outer web of outermost primary, and no wing-bars; tail rounded, mueh shorter than wing. *Adult male in breeding plumage:* Forehead and top of head blaek, the feathers more or less tipped with ashy or slate-gray whieh predominates toward nape; stripe over eye, around back of eye and more or less of lower eyelid, yellow; rest of upper plumage, wings and tail olive-green; inner webs and tips of flight-feathers darker; patch extending from bill to eye (broadening as it goes), under and behind eye (narrowing as it reeedes), and ending down side of throat, black; lower jaw and lower plumage bright lemon-yellow, slightly shaded with olive on sides of breast, sides and flanks; under wing-eoverts chiefly yellow; bill dark brown, pale at base below; "iris dark brown; legs, feet and elaws pale flesh-eolor" (N. S. Goss). *Adult male in winter*

[1] Oölogist, Vol. XVI, 1899, p. 49.

PLATE 86

PLATE 86

KENTUCKY WARBLER
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ADULT MALE

CONNECTICUT WARBLER
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IMMATURE MALE

ADULT MALE

IMMATURE FEMALE

MOURNING WARBLER
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ADULT MALE

YELLOW-BREASTED CHAT
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ADULT MALE

IMMATURE MALE

MARYLAND YELLOW-THROAT
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ADULT MALE

ADULT FEMALE

Allan Brooks

plumage: Similar to same in spring, but more gray tips on top of head, and black feathers on sides of head tipped yellowish. *Young male in first winter plumage:* Similar to adult male in fall and winter, but gray tips on top of head browner and black areas less clearly defined. *Adult female in breeding plumage:* Resembles adult male in color and markings, but duller, black areas merely dusky and smaller, not extending so far back as in male. *Adult female in winter plumage:* Similar to same in spring, but dark areas somewhat more veiled with light tips. *Young female in first winter plumage:* Apparently indistinguishable from adult female in fall and winter. *Young in juvenal plumage:* Very similar to juvenal Connecticut Warbler, but shows two brown wing-bars which the latter does not; above, *including sides of head, brown or olive-brown;* no black or yellow on head; tail and flight-feathers as in adult; wing-coverts edged with lighter brown; below paler brown, tinged yellowish on belly and under tail-coverts; "bill and feet flesh-color, the former becoming dusky" (J. Dwight).

Measurements. — Length 5.00 to 5.85 in.; spread 8.10 to 9.25; folded wing 2.50 to 3.00; tail 1.90 to 2.25; bill .51 to .57; tarsus .85 to .87. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt involving only body plumage and wing-coverts; first breeding plumage by partial prenuptial molt about head, chin and throat; adult winter plumage by complete postnuptial molt; adult breeding plumage by partial prenuptial molt as in young bird, or by wear.

Field Marks. — Size of Chipping Sparrow. *Adults:* Olive-green above with a black or dark forehead, *a yellow streak over and partly around eye,* and a black or dark patch from bill to and under eye and down sides of throat; below yellow; female duller than male, with less black about head and throat. *Young:* Similar to female. A shy bird of the undergrowth; walks, and tilts its body much like Water-Thrush.

Voice. — Call, a low-pitched *chuck,* not unlike that of Phœbe; alarm note, a metallic *cheek, chuck* or *chip;* song, early migrants, an incessant clear whistled *che che che peer-ry peer-ry peer-ry peer-ry;* breeding birds, a loud, clear, musical whistled *tur-dle tur-dle tur-dle, ter-wee-o ter-we-o ter-we-o,* or *ter-wheeter-wheeter-wheeter-wheeter,* similar to one song of Carolina Wren, but less ringing and lively, and with falling inflection (G. F. Simmons); an oft-repeated loud song of three notes, *tweedlé tweedlé tweedlé* (N. S. Goss); *wheeter wheeter wheeter wheeter wheeter* (H. W. Wright).

Breeding. — In open, bushy swamps, on brushy, moist hillsides, in wooded bottom lands, sprout-lands, bushy clearings, or the edges of woodlands where the undergrowth is rank and soil moist, or in wooded, well watered ravines. *Nest:* On or near ground in thick growth, well concealed, among roots of fallen tree, at foot of tree concealed by bushes, ferns, etc., in all sorts of unexpected places; quite bulky, composed outwardly of dead leaves, grasses and weed stalks, lined with rootlets or horse hair, or both, pine needles sometimes used. *Eggs:* 4 or 5, rarely 6; .69 to .79 by .53 to .60 in.; ovate to rounded ovate or oblong ovate; glossy white, spotted, speckled and sometimes blotched with reddish-brown, burnt umber and lilac or lilac-gray, usually massed more or less at large end; figured by F. M. Chapman in "The Warblers of North America," Figs. 100, 101. *Dates:* May 10 to 25, Virginia; May 18 to June 10, Pennsylvania; June 1 to June 12, southeastern New York. *Incubation:* By female. Two broods yearly in the south (Audubon).

Range. — Eastern United States to northern South America. Breeds in Upper and Lower Austral zones from central-eastern Nebraska, northeastern Iowa, southern Wisconsin, southern Michigan, northern Ohio, southern New York and southern Connecticut south to south-central and southeastern Texas, southern Louisiana, southern Alabama and southern Georgia; winters from Tabasco, Campeche and Chiapas (Mexico) through Central America to Colombia; casual in southeastern Ontario, Vermont and Massachusetts; accidental in Cuba.

Distribution in New England. — Accidental summer visitor and occasional summer resident in southern parts. Records: *Vermont:* Lunenburg, May 30, 1905, one taken by W. E. Balch, specimen now in the Fairbanks Museum at St. Johnsbury.[1] *Massachusetts:* Wellesley Hills, May 14, 1907, one

[1] Cooke, Wells W.: Auk, Vol. XXV, 1908, p. 320.

seen by the late Horace W. Wright;[1] Boston (Arnold Arboretum), June 22, 1913, a male seen by Harold L. Barrett.[2] *Rhode Island:* Newport (Fort Adams), "in the spring of 1890," one observed by Lt. Wirt Robinson.[3] *Connecticut:* Suffield, August 16, 1876, a male taken by Erwin I. Shores;[4] West Stratford, May 30, 1888, a male taken by W. H. Lucas.[5] It will be noted that the first record given above for Massachusetts is a sight record, which was accepted for publication by the editor of The Auk, who perhaps considered that he was justified in so doing by the well known qualifications of the observer, or by the fact that a specimen had been taken in northern Vermont. I have three sight records prior to that of Mr. Wright, also some other unpublished notes as follows: *Maine:* Fryeburg, September 4 and 5, 1918, one bird, September 30 and October 1, 1918, a pair, June 1, 1919, a pair; all seen by Miss Harriet Abbott. *Massachusetts:* Medford, May 31, 1898, my then assistant, the late F. H. Mosher, who was watching birds feeding upon caterpillars on the morning of that day, reported that a male Kentucky Warbler came into some bushes along the water side where he was stationed, announcing its coming by its loud song. Mr. Mosher wrote that when the bird had fed sufficiently in the bushes, it went into a near-by birch and remained near his position for fifty minutes, so that he had every opportunity to fix its identity positively. So far as I know this was the first bird of the species authentically reported in Massachusetts. Dr. Holder, however, in his list of the birds of Lynn, mentions a specimen then in the collection of the Lynn Natural History Society.[6] Northfield, Lilian M. Thayer wrote on June 9, 1916, "in *May, 1908*, I saw a pair several mornings in succession in the same locality"; Charlemont, "in the *spring of 1902*," adds Miss Thayer, "I became acquainted with a pair I found nesting in a white pine sapling in Charlemont about two feet from the ground. The sapling was the center of a clump of bushes by the side of the old road that followed along the Deerfield River. I visited the spot sometimes twice a day, for several days, and finally the birds became so accustomed to seeing me that they would remain on or near the nest and allow me to approach within three feet." Winchester, May 17, 1909, a singing male was observed for some time by Miss Grace M. Snow. Southampton, May 11, 1918, one seen by Miss Bessie M. Graves. Edgartown, August 21, 1919, one seen by Mrs. Mona W. Worden, and this or another also reported to her several times during the summer. Fall River, July 29 and 30, 1928, one observed by Mrs. F. W. Lawson and by Mrs. M. B. Horton.

Season in Massachusetts. — Reported from May 11 to August 21.

Haunts and Habits. The Kentucky Warbler habitually feeds on or near the ground, but it usually sings in the trees. It is extremely active and usually shy and suspicious. As it commonly keeps in rather thick cover it might escape notice were it not for its habit of loud and persistent singing. Regarding this habit Dr. Chapman says "in the height of the breeding season this warbler is a most persistent singer. On one occasion, at Englewood, New Jersey, I watched a male for three hours. During this period, with the exception of five interruptions of less than forty-five seconds each, he sang with the greatest regularity once every twelve seconds. Thus, allowing for the brief intervals of silence, he sang about 875 times, or some 5,250 notes. I found him singing, and when I departed he showed no signs of ceasing."[7]

During its stay in the north the bird seldom flies far, but keeps rather closely to the

[1] Auk, Vol. XXIV, 1907, pp. 344–346.

[2] Auk, Vol. XXX, 1913, p. 587.

[3] Howe and Sturtevant: Birds of Rhode Island, 1899, p. 81.

[4] Merriam, C. Hart: A Review of the Birds of Connecticut, 1877, p. 22.

[5] Ornithologist and Oölogist, Vol. XIV, 1889, p. 62.

[6] Holder, J. B.: Publications of Lynn Natural History Society, No. 1, Catalogue of the birds noticed in the vicinity of Lynn during the years 1844–'5–'6, 1846.

[7] Chapman, F. M.: Handbook of Birds of Eastern North America, 1914, p. 464.

cover of trees, shrubbery and the rank plants that grow in moist or swampy land. On the ground it walks very prettily in the manner of the Oven-bird, and often tilts its body and wags its tail up and down, though not so much addicted to this habit as are the water-thrushes. It frequents boggy woodlands, especially their bushy borders, deep, dark, gloomy swamps and shores of bush-bordered streams and ponds, and delights in dark boggy tangles where the way is obstructed with fallen logs or uprooted trees. The nest, in the construction of which both sexes share, is so well concealed that it is seldom found except by accident or by watching the birds while engaged in building it, or in feeding the young, a task which occupies both parents. When the female is incubating she uses great care in entering and leaving her little domicile not to betray it to any enemy. The young are ready to leave the nest in about eight days from the date of hatching. Probably but one brood is reared in the northern part of its range, as the species begins to move southward in August. In migration it sometimes may be found along the edges of fields and in other situations where one would hardly expect to find it. In autumn it is silent, keeps well under cover, and is likely thus to escape notice.

The food of this bird consists in part of grasshoppers and locusts, caterpillars and the larvæ of other insects, moths, plant-lice, grubs, spiders and other animal food that it finds chiefly on or near the ground, or in bushes, vines or the lower parts of trees. In summer it takes some berries. Mr. A. H. Howell reports that two stomachs of the species from Alabama contained remains of bugs, beetles, ants and other hymenoptera,[1] but little is known regarding the food preferences of this bird.

Economic Status. See page 197.

Oporornis agilis (Wilson). Connecticut Warbler.

Plate 86.

Description. — Form similar to that of Kentucky Warbler, but coloration quite unlike it; under tail-coverts copious and long, reaching two-thirds length of tail. *Adult male in breeding plumage:* Above, including wings and tail, chiefly olive-green or brownish-olive-green; head, neck and upper breast slate-gray, darkest on top of head and on upper breast; a conspicuous narrow white eye-ring; lower breast, belly, under tail-coverts and under wing-coverts olive-yellow; sides and flanks tinged olive-green; bill dark brownish above, darkening at tip, lighter below; iris brown; legs and feet flesh-color. *Adult male in winter plumage:* Similar to same in spring, but top of head brown, and feathers of throat and chest paler gray tipped indistinctly with brown. *Young male in first winter plumage:* Similar to adult male in fall and winter, but crown brownish-olive; throat and cheeks more brown or yellowish-brown paling on throat; eye-ring slightly tinged buffy. *Adult female in breeding plumage:* Similar to young male in first winter plumage but crown more olive, under plumage much paler or duller than in adult male, throat and upper breast brownish. *Adult female in winter plumage:* Similar to adult female in spring, but browner on breast. *Young female in first winter plumage:* Usually resembles adult female in fall, but sometimes practically indistinguishable by plumage from young male at that season. *Young in juvenal plumage:* Similar to Kentucky Warbler in same plumage, but without light brown tips to greater wing-coverts.

[1] Birds of Alabama, 1924, p. 316.

Measurements. — Length 5.20 to 6.00 in.; spread 8.50 to 9.00; folded wing 2.65 to 3.00; tail 1.85 to 2.25; bill .40 to .48; tarsus .70 to .90. Female smaller than male.

Molts. — Apparently same as those of Kentucky Warbler (see page 287).

Field Marks. — Size of Chipping Sparrow. *Adult male:* Fore parts, sides of head, chin, throat and upper breast slaty-gray, forming a distinctly outlined apron on upper breast, somewhat veiled in fall by light feather-tips; above, olive-green, below pale yellow; *yellow under tail-coverts two-thirds length of tail;* complete *white eye-ring,* no other white marks. *Female and young:* Similar but duller; fore parts olive-green on top of head, pale brownish on throat and upper breast, darkening toward bottom of apron on breast; whitish eye-ring tinged slightly brownish or buffy. Mourning Warbler is sometimes mistaken for Connecticut Warbler. The male of former has black on breast, where latter has only a gray apron, and has no eye-ring; females and young are very similar to those of the latter, and have a somewhat similar eye-ring (see *Field Marks* under Mourning Warbler). Frequents bushes about swamps and underbrush at edges of low moist woodlands.

Voice. — Call, a sharp *peek;* song (rarely heard in New England), *beecher-beecher-beecher-beecher-beecher-beecher,* like that of the Oven-bird, but of same pitch and power throughout; *fru-chapple fru-chapple fru-chapple whoit* (E. E. T. Seton); *too-too-whit* while the bird's body shakes and wings and tail vibrate furiously (Mrs. J. V. Farwell, Jr.); freecher-here freecher-here freecher-here freech (N. L. Huff).

Breeding. — In tamarack swamps. *Nest:* Sunk in swamp moss, composed chiefly of grass. *Eggs:* 4; .75 to .84 by .56, to .61 in.; "creamy-white with a few spots of lilac-purple, brown, and black, inclined to form a ring at the large end" (E. E. T. Seton), massed at larger end (N. L. Huff); figured by N. L. Huff in Auk, Vol. XLVI, 1929, Plate XXVI.

Range. — Eastern and central North America to northern South America. Breeds in Canadian Zone from central Alberta, Saskatchewan (probably) and southern Manitoba to central Minnesota, southern Wisconsin, northern Michigan and southeastern Ontario; winters from northern Venezuela and Colombia (probably) to northwestern and southeastern Brazil; migrates through Florida and the Bahamas; in the United States in spring rare east of Alleghanies, but common in Mississippi Valley; in autumn rare in Mississippi Valley, but common east of Alleghanies north to Massachusetts and (casually) to Maine; casual or accidental in North Dakota, Nebraska, Colorado and Costa Rica; not recorded from the West Indies.

Distribution in New England. — Uncommon to rare fall migrant, most common in Connecticut; accidental or casual in spring.

Season in Massachusetts. — (May 6) May 10 to 28; September 7 to October 11.

Haunts and Habits. My experience with the Connecticut Warbler has been confined to the fall migration, and to dense thickets along the edges of moist or swampy woodland. Most New England ornithologists have had similar experiences, and have never seen the bird in this region in spring. Mr. William Brewster, with whom I have searched for this bird, was an expert in such matters and although he had seen and taken many in autumn, he not only had seen none in spring, but said that there was no record in which he had full confidence of the appearance of the bird in Massachusetts in spring. Nevertheless a male was reported as taken in Connecticut on May 30, 1888, by W. H. Lucas,[1] and between the years 1917 and 1928 fully a score of reports of the species have come to me from trustworthy observers. Not one of these birds, however, was taken, as the observers were not collectors. Twice a pair was seen, but in most cases where the sex was mentioned the bird was a male and unmistakable. When the bird seen is a

[1] Ornithologist and Oölogist, Vol. XIV, 1889, p. 62.

female the report must be received with caution, as contrary to many published descriptions the female Mourning Warbler may have a light eye-ring much like that of the Connecticut Warbler. The following reports are examples of sight records which cannot be doubted: May 10 and 11, 1922, Mr. R. W. Myrick saw a male on the north side of Wachusett Mountain, and again on the succeeding Saturday. On the latter date he finally approached to within six feet of it and every marking was distinctly seen; the white eye-ring and lack of black on the breast were carefully noted. On May 28, 1917, Mr. A. A. Cross, of Huntington, saw a male and had an excellent opportunity to look it over in a good light. He is a very capable observer and is positive that the bird was a Connecticut Warbler. On May 23, 1920, Mrs. F. B. Goode, of Sharon, saw a pair on the hedge by her living room window, where they fed all the morning, sometimes coming within four feet of her position, and apparently undisturbed by her presence.

Mr. William Brewster, who, in company with Mr. Henry W. Henshaw, was very successful in finding this species in the Fresh Pond region in Cambridge in 1870 and 1871, wrote of his experiences as follows: "We used to find the Connecticut Warblers oftenest among the thickets of clethra, *Andromeda ligustrina*, shad-bush, and black alder, which formed a dense undergrowth beneath the large maples that shaded the wooded islands of this swamp, and in the beds of touch-me-not (*Impatiens*) that covered some of its wetter portions. They were also given to frequenting the banks of the numerous intersecting ditches, especially where the deadly nightshade, clinging to the stems of the bushes, trailed its gray-green foliage and coral-red berries over the black mud or coffee-colored water. In such places they often literally swarmed, but so retiring and elusive were they that by anyone unacquainted with their habits they might easily have been overlooked. They spent most of their time on the ground under or among the rank vegetation, where they would often remain securely hidden until nearly trodden on. Indeed we learned eventually that the only certain method of starting all the birds that a thicket contained was to beat the place closely and systematically many times in succession. When flushed they would usually fly up into the low bushes and sit there motionless in thrush-like attitudes, gazing at us intently with their large dark eyes. If further disturbed, they were nearly sure to take long flights to distant parts of the swamp. During cloudy weather we sometimes found them feeding with the Black-poll Warblers in the tops of large willows, fifty or sixty feet above the ground. The earliest date on which they were ever seen by us was September 7 and the last stragglers usually departed for the south before the 1st of October. They never appeared in spring, nor is there a single record in which I have full confidence of their occurrence at that season in any part of Massachusetts." [1]

In migration through New England, the Connecticut Warbler frequents swampy, bushy, moist lands, or weed patches and brier patches along the edges of moist fields and pastures, keeping usually well within thick cover, near the ground, where it remains for the most part silent. It is generally so secretive that its habits and food are little known.

[1] Birds of the Cambridge Region, 1906, pp. 351, 352.

Economic Status. While this warbler feeds to a large extent on insects, we have little exact information on which to base an intelligent estimate of its economic value.

Oporornis philadélphia (Wilson). Mourning Warbler.

Plate 86.

Description. — Form similar to that of Connecticut Warbler, but under tail-coverts much shorter. *Adult male in breeding plumage:* Head and neck slate-gray, deeper above, slightly lighter on chin and throat, where narrowly barred black, the black bars becoming *wider where throat meets upper breast,* upper part of which is *nearly all black;* lores often blackish; feathers of throat and upper breast really black with gray tips, which conceal much of the black; in highest spring plumage chin, throat and upper breast sometimes almost entirely black; above from base of neck to tip of tail olive-green; ends of flight-feathers brownish; *no whitish except on edge of outer primary;* below from upper breast to tail bright canary-yellow darkening to olive-green on sides and flanks; bill brownish-black above, lighter below; iris hazel; legs and feet pale flesh-color. *Adult male in winter plumage:* Similar to adult male in spring, but black of upper breast more veiled with gray. *Young male in first winter plumage:* Similar to adult male in fall and winter, but little if any black on throat; chin yellowish-white; conspicuous eye-ring and streak over eye pale yellow; similar to young male Connecticut Warbler, but with grayish tinge about head, greener above and brighter yellow below. *Adult female in breeding plumage:* Similar to adult male but usually without black, rarely with a little black, *usually with a nearly complete whitish eye-ring;* head, neck and upper breast smoke-gray, lightening in some cases to almost white on chin and upper throat. *Adult female in winter plumage:* Closely resembling young male in fall and winter. *Young female in first winter plumage:* Similar to adult female in fall and winter, but not so gray on throat. *Young in juvenal plumage:* Brown or olive-brown above; wings and tail much as in adult; below very deep grayish-tawny-olive; abdomen and crissum pale brownish-yellow; inconspicuous eye-ring pale buff; "bill and feet pinkish-buff becoming sepia-brown" (J. Dwight).

Measurements. — Length 4.90 to 5.75 in.; spread 7.60 to 8.15; folded wing 2.30 to 2.60; tail 1.95 to 2.25; bill .48 to .53; tarsus .80 to .94. Female smaller than male.

Molts. — Similar to those of Kentucky Warbler (see page 287), though the molt into first winter plumage seems to occur mostly in August.

Field Marks. — Size about that of Chipping Sparrow. *Adult male:* Resembles Connecticut Warbler somewhat, with gray head and neck, but lacks the white eye-ring and shows more or less *black on upper breast. Female and young:* Very similar to female and young of Connecticut Warbler; both show whitish eye-ring, and both have a shade of gray on throat and breast; under tail-coverts of Mourning Warbler are shorter than the long and copious ones of Connecticut Warbler, but this cannot be noted unless the bird is above the eye.

Voice. — Calls, a sharp chirp and a feeble *tsip* (H. D. Minot); song, resembles the syllables *thur-ree, thur-ree, thur-ree,* three notes with the last accented; two notes sometimes added with strong accent on first, falling inflection on second (Walter Faxon); *tee, tee, whit-ee, whit-ee, whit-ee,* (L. T. Little); *'trúe 'trúe 'trúe 'trú 'toó,* the last two syllables more softly and with falling inflection (C. Hart Merriam); *whit whit whit wit wit,* first three notes deliberate, loud, on one key, last two a little lower, shorter, accented on first of the two (Bradford Torrey); *tee te-o te-o te-o we se,* last couplet accented and much higher pitched (Lynds Jones); song described by various writers as suggesting that of the Maryland Yellow-throat, Kentucky Warbler, Oven-bird and Water-Thrush.

Breeding. — In clearings, grown up to weeds, bushes, briers and sprouting saplings, often encumbered with logs or tree-tops, along bushy roadsides, bushy borders of woodlands, or overgrown swampy clearings. *Nest:* Usually in a thicket or clump of weeds quite near the ground or among shoots springing from a stump; "composed of weed stalks with layers of leaves mixed in, and lined with fine black root-

lets" (E. G. Tabor); grass and horsehair sometimes used. *Eggs:* Indistinguishable from those of Kentucky Warbler, but probably average smaller; figured by E. A. Capen in "Oölogy of New England," Plate V, Figs. 12, 13, and by F. M. Chapman in "The Warblers of North America," Figs. 102, 103. *Dates:* June 8, New Hampshire; June 3 to 14, southern Ontario; June 10 to 16, Maine. *Incubation:* By female chiefly or wholly. One brood yearly.

Range. — Eastern and central North America (east of Rocky Mountains) to Central America and northern South America. Breeds chiefly in Canadian Zone from central-western Alberta, central Saskatchewan, southern Manitoba, central-eastern Ontario, southwestern Quebec, northern New Brunswick, Magdalen Islands and Newfoundland south to northern North Dakota, eastern Nebraska (casually), central Minnesota, southern Michigan, southeastern Ontario, Pennsylvania, West Virginia (mountains) and northern Massachusetts; in migration west to central North Dakota, South Dakota, eastern Nebraska, eastern Kansas and eastern Oklahoma and east commonly to the Alleghanies, but very rare or unknown in the Atlantic and Gulf states from North Carolina to Mississippi; winters from Nicaragua and Costa Rica to Colombia, Venezuela and Ecuador; accidental in Greenland; not recorded from the West Indies.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Uncommon migrant; uncommon summer resident in northern parts or high altitudes, south in Vermont to Londonderry. *Massachusetts:* Rare migrant; in Berkshire County rare summer resident at high altitudes. *Rhode Island and Connecticut:* Rare migrant.

Season in Massachusetts. — (May 1, 6, 7) May 10 to June 6 (summer); September 12 to October 3.

Haunts and Habits. The Mourning Warbler is a striking and beautiful bird, though frontally "veiled in crêpe." This crêpe-like marking about the breast is the only thing about the bird that would suggest mourning, for it seems as happy and active as most birds, and its song is a pæan of joy.

It has always seemed to be one of the rarest of New England warblers, but its apparent extreme rarity is due in part to the fact that although a straggler may appear very rarely early in May, the main spring migration does not reach Massachusetts until late May and early June, when most observers are not looking for migrating warblers, and the foliage has become so dense that the bird can skulk most of the time in cover. On its breeding grounds the male, when undisturbed, will sit on the branch of a dead tree for all the world to see, giving out intermittently his full-voiced song, but upon the appearance of a human intruder he is likely to dive into the brush and conceal himself so effectually that his occasional song will be the only indication of his whereabouts. In migration the bird skulks silently from thicket to thicket and rarely makes its presence known. An unusual noise, like the imitation of the cry of a wounded bird, may so stimulate its curiosity as to cause it to show itself for a moment, only to disappear for good and all. Such, at least, is my own experience with this elusive little feathered biped. The earlier American ornithologists saw little of it despite their extended pedestrian wanderings. Wilson collected but one and saw no other specimen. Audubon's experience with it was similar, and Nuttall believed that he once saw it. Even to-day we know little about it.

In the breeding season I have found it in high, dry clearings overgrown with underbrush and briers, such as may be found on Hoosac Mountain or on the Saddleback Range in northern Berkshire County, Massachusetts. But during its migration it seems to

haunt dense thickets along the streams, especially in swampy localities where it consorts with other warblers.

Ordinarily we seldom see it in New England until late May, and in September it appears again in company with Maryland Yellow-throats, Palm Warblers, Myrtle Warblers, White-throated Sparrows, Swamp Sparrows and other birds of the thickets, that make up the little wandering groups of the fall migration. The Mourning Warbler is not, however, confined to swampy localities, and may be found occasionally far from water, but seldom far from good cover. Sometimes it betakes itself to some tall tree-top where it can survey its surroundings.

When the female is flushed from the nest, she slips quietly away under cover and therefore it is difficult to identify her. When the young have been reared the parents remain with them near the place of their nativity until the molt is finished, and before September ends most of them have left New England for the south.

The food of the Mourning Warbler seems to be its own secret. Dr. B. H. Warren found beetles and spiders in the stomachs of two birds, but so far as I know no careful analysis of its food has been made.

Economic Status. Unknown.

Geóthlypis trichas trichas (Linnæus). Maryland Yellow-throat.

Other names: NORTHERN YELLOW-THROAT; YELLOW-THROAT; GROUND WARBLER.

Contributed by Maurice Brown.

Plate 86.

[Note. The name *Geothlypis trichas brachydactyla* (Swainson), Northern Yellow-throat, is accepted quite generally at this time as applying to the bird described here as *G. t. trichas*, Maryland Yellow-throat, the latter name now being bestowed on a form of the species occupying the southern Atlantic coast of the United States and along the Gulf coast to Texas. As the former name has not (1928) been included in any of the Supplements to the American Ornithologists' Union Check-List of 1910, Mr. Broun, following the Check-List, has described the bird under the old name. William Brewster said, in his "Birds of the Cambridge Region of Massachusetts": "The characters by which the two forms are said to be separable seem to me trivial and I fear they are also inconstant, for I have specimens taken in Massachusetts and Connecticut which I cannot distinguish from typical examples of *trichas* from the Middle States." But the characters given by Ridgway seem usually to hold. They are: "Similar to *G. t. trichas*, but averaging larger; adult male with underparts more extensively yellow (often almost wholly yellow) and upper parts more decidedly olive-green; adult female usually with the yellow of underparts brighter and more extended than that of *G. t. trichas*." [1] It is not improbable that both these so-called races and their intermediates will be found in southern New England. E. H. F.]

Description. — Bill much shorter than head, without bristles; wings short and rounded; tail nearly same length as wings; tarsus more than one-third as long as wing. *Adult male in breeding plumage:* Forehead and sides of head deep black, forming a broad mask, bordered behind and above by a band (variable in width) of light bluish-white or gray; rest of upper plumage, wings and tail olive-green; chin, throat, breast, edge of wing and wing linings yellow; abdomen whitish or pale buffy, becoming grayish-brown on sides; under tail-coverts pale yellow; bill black; iris brown; "legs and feet flesh-color"

[1] Ridgway, R.: United States National Museum, Bulletin No. 50, Part II, 1902, p. 664.

(A. Brooks). *Adult male in winter plumage:* Similar, but browner above particularly on hind neck; feathers of black mask tipped more or less with grayish; abdomen washed with yellow and sides browner. *Young male in first winter plumage:* Similar to adult female in winter plumage, but forehead and sides of head marked with more or less blackish, rarely with black mask nearly complete; crown entirely olive-brown; lores dull yellowish. *Adult female in breeding plumage:* No black mask; crown and sides of head grayish-olive, forehead often tinged with cinnamon-brown; eye-ring whitish; rest of upper plumage, wings and tail olive-green, becoming greener on rump and upper tail-coverts; edge of wing yellow; lower plumage similar in coloration to adult male, but yellow paler and more restricted; bill, legs and feet as in male. *Adult female in winter plumage:* Similar, but upper plumage, sides and abdomen browner; throat and upper breast yellower. *Young female in first winter plumage:* Similar to adult female in winter plumage, but more uniform brown above, and throat and upper breast pale yellow. *Young in juvenal plumage:* Brownish-olive above, becoming more olive-greenish on wings and tail; middle and greater wing-coverts indistinctly tipped with cinnamon; throat, upper breast, sides and flanks buffy-olive; rest of under plumage pale buffy-yellowish.

Measurements. — Length 4.40 to 5.75 in.; spread 6.50 to 7.20; folded wing 2.05 to 2.20; tail 1.90 to 2.05; bill .49 to .56; tarsus .73 to .81.

Molts. — Natal down of nestling succeeded by juvenal plumage; first winter plumage acquired by partial postjuvenal molt (July, August), in which flight-feathers and tail-feathers are retained; first nuptial plumage produced by partial prenuptial molt (December to February) which affects chiefly head and chin; the feathers of these areas much worn when birds arrive in New England in May, and young birds become indistinguishable from old; adults have complete postnuptial molt (July, August); adult breeding plumage probably acquired by wear.

Field Marks. — Bright yellow throat and breast, and black mask of adult male are easily recognized. Adult female and young do not have the black mask and are very much alike. They are identified by yellowish throat and breast, buffy-white belly, washed with brownish on sides, and yellowish under tail-coverts; may be confused with Nashville Warbler, but gray head and entirely yellow under plumage of latter readily separate them; in the fall young males may have a more or less pronounced indication of the black mask. This species has no wing-bars or white markings on tail.

Voice. — Notes, a sharp *quit, chit, chick* or *chack;* song, — although much varied in different localities, the distinctive rhythm, the loud, clear and ringing quality of the tone, and the repetition of strongly accented syllables, combine to make the song unmistakable; in trisyllabic utterances, accent generally comes on first syllable; most commonly rendered *witchity, witchity, witchity,* or *wée-chee-te, wée-chee-te, wée-chee-te,* or *witchery, witchery, witchery;* "(a) *weé-seé-see, weé-seé-see, weé-seé-see,* (b) *wee-scé-ser, wee-seé-ser, wee-seé-ser,* and (c) *wee-see-seé-see, wee-see-seé-see, wee-see-scé-see*" (R. Hoffmann); *peachity, peachity, peachity* (O. W. Knight); *I beseech you, I beseech you, I beseech you, I beseech you* (F. M. Chapman).

Breeding. — In wet bushy meadows, open swampy thickets, on the margins of damp woods and woodland streams or ponds, in cattail bogs, bushy pastures and in dense tangles near water. *Nest:* On or near ground, among weeds, sedges or shrubs, in grassy tussocks, and not infrequently among ferns and in low bushes and briery tangles; composed of dried leaves, coarse grasses and strips of bark, lined with finer grasses, tendrils, rootlets and sometimes a few hairs; rather bulky but carefully concealed, deep and cup-shaped, and sometimes roofed. *Eggs:* 3 to 5, commonly 4, very rarely 6; .56 to .78 by .47 to .60 in.; ovate; creamy-white, thinly or profusely speckled, spotted and streaked with reddish-brown, purplish-black, umber and lilac; markings chiefly, sometimes entirely, at the larger end; figured by E. A. Capen in "Oölogy of New England," Plate V, Figs. 9–11, and by F. M. Chapman in "The Warblers of North America," Figs. 107–109. *Dates:* May 25 to June 15, New York City; May 28 to June 18, Connecticut; May 24 to June 17, Massachusetts; May 28 to June 12, Maine. *Incubation:* Period 12 days. One or two broods yearly.

Range. — Eastern North America and Central America. Breeds chiefly in Canadian and Transition zones from southern Manitoba, northeastern Ontario, southeastern Quebec and Newfoundland

south to northern Oklahoma, southern Missouri, southern Illinois, Indiana, Ohio, northern Pennsylvania, New Jersey and Long Island (New York); winters from Texas, central Louisiana and North Carolina to Florida, the Bahamas, Cuba, Porto Rico, Jamaica, Swan Island (Caribbean Sea) and through eastern Mexico to Guatemala, Costa Rica and Panama; accidental on the island of Tobago.

Distribution in New England. — Very common migrant and summer resident throughout the region, except on higher elevations in New Hampshire. Accidental in winter.

Season in Massachusetts. — (April 30) May 2 to October 21 (winter).

Haunts and Habits. Dear to the heart of every bird lover is that engaging warbler with the bright yellow bib and black domino, the Maryland Yellow-throat. To make his acquaintance one has only to visit his favorite haunts — tangled shrubbery by the brookside and dense coverts that margin swampy woodland, or matted reeds and sedges of the swamp — when presto! up bobs that masquerading scrap of animated feathers, nervously voicing his alarm with a variety of scolding chirps and chattering notes, his black eyes sparkling with excitement. Suddenly he explodes in a vigorous outburst of song, as if to inquire *"whatcha-see, whatcha-see, whatcha-see"* and darting impatiently here and there in the low undergrowth, plainly announces that his privacy has been disturbed; but his curiosity and indignation are soon over, and, scurrying to the shelter of his retreat, he leaves the cause of his disquietude flooded with emotions of surprise and delight. The Yellow-throat captivates one's fancy. His attractive plumage and winsome, wren-like manners give him a marked individuality which few birds possess, and such traits being decidedly uncommon in a warbler, account for his great popularity. Far less handsomely attired is the object of his affections; but despite the subdued colors of the female, she is always recognizable by the distinctive Yellow-throat personality.

By no means is this lively little favorite wholly partial to swampy localities, for we often find it in the woods and orchards, and even in bushy pastures. Seldom does it mount to the tree-tops, but even during migrations it may be found in the lower branches. From its habit of breeding and spending most of its time on or very close to the ground, it has obtained the name of Ground Warbler. This title, however, is perhaps more fittingly applied to the Oven-bird than to the subject of this sketch.

During the breeding season the Yellow-throat is strongly attached to the immediate neighborhood of its domestic activities, where it restlessly skulks and hops about the bushes and brambles much in the manner of a wren. It is very resentful of intrusion, and will give vent to its displeasure with vigorous protests of harsh, rasping notes, and sometimes a peculiar snarl.

Although rather bulky, the nest is so well concealed that it is usually found only by flushing the female. Occasionally nests are found well above the ground, in bushes or tangles of briers, and I have seen one about a foot up, lodged in a thick mass of spruce foliage. In "The Warblers of North America" (1917, p. 257) Dr. F. M. Chapman makes the statement that nests are sometimes built as high as five feet from the ground. Mr. Arthur W. Brockway tells of a female that built her nest in one of a pair of shoes left

out on the projecting underpinning of a house; she laid five eggs and began to incubate, when she was attacked by a dog.[1]

Nest construction is accomplished solely by the female in a little over a week, and to her also fall the cares of incubation. She is a fearless, devoted mother, and zealously guards the contents of her nest. Often while she is brooding one can almost stroke her back. The male is not wholly idle, however, for when the young hatch, he is a faithful, assiduous worker in feeding them. If everything goes well, after two weeks the young birds follow their parents into the wide world.

As an example of Yellow-throat intelligence, the following is quoted from an interesting study of the nesting of a pair of these birds, made by Mr. Alfred C. Redfield: "On one occasion the male fed two of the young. Before he had left, the female arrived with an insect. He held his bill toward her as though wishing to take the food from her. Not heeding him she proceeded to feed the young one last favored by the male. Quickly her mate removed the food from the young one's mouth and thrust it into the bill of the third young one, which had received nothing. This would make it appear that the parent birds do actually keep some account of which young they have last fed." [2]

But its intelligence is not so manifest when it comes to coping with the problem of the interloping Cowbird. Indeed, the Yellow-throat then shows little discernment, for it feeds and fosters the rapidly growing foundling to the almost entire exclusion of its own young, so that the consequences of such neglect too often prove fatal to the rightful progeny.

Of considerable variability is the Yellow-throat's song; still it is one of the easiest to learn, by virtue of its peculiar swing and loud, pleasing notes. Soon after the male arrives at its summer home from southern climes, its rollicking medley is heard. It sings constantly until the latter part of July, when the almost universal lull in bird song takes place; then, however, it may continue to sing more or less, but with diminished spirit, until the first few days in September, when its voice is seldom heard. Sometimes odd songs are uttered, which seem to have no proper place in the catalogue of Yellow-throat vocalization. Mr. Frank L. Burns described half a dozen birds with unusual songs. "One male sang *che-e-e-e-e-e* like the Worm-eating Warbler. The five other males . . . sang *che-a-we-a, che-a-we-a, che-a-we-a*, occasionally transposing the syllables *-we-a-che-a*." In the same article Mr. Gerald H. Thayer wrote interestingly of his observations: "Like the Chestnut-side it sometimes mocks, or seems to mock, other birds. Queerly enough, in the only case of this I was ever witness to, the bird mimicked was a Swamp Sparrow, just as with the Chestnut-side. The imitation was equally adequate and convincing, and was repeated many times; — a long, loud, rattling Swamp Sparrow trill, ending with a few normal *witty-titty* notes of the Yellow-throat song. Like the Chestnut-side, too, this bird lived among Swamp Sparrows." [3]

The Yellow-throat also has a flight-song, which is really nothing more than a silly little

[1] Auk, Vol. XVI, 1899, pp. 360, 361. [2] Bird-Lore, Vol. XIII, 1911, p. 197.
[3] Chapman, Frank M.: The Warblers of North America, 1917, p. 256.

outburst of ecstasy, consisting of a brief utterance of confused and spluttering notes as it springs a few feet into the air. It is heard throughout the breeding season and into late summer.*

Of all the useful warbler clan, the Yellow-throat is one of the most beneficial to the agriculturist. In its habit of frequenting a variety of situations, its feeding range is perhaps wider than most warblers, and this, coupled with its abundance, adds to its economic importance. It is particularly fond of canker-worms, for which it scours the orchard; it eagerly eats fall web-worms, and destroys immense numbers of many other destructive caterpillars, including those of the gipsy moth; grasshoppers and leaf-hoppers bring the bird to the fields, where it makes of these insects important articles of diet, while plant-lice, flies and beetles help to appease this bird's voracious appetite. Its menu contains also such delicacies as grubs, small moths, spiders, ants and the larvæ of many insects, all of which it consumes in considerable quantities.

Economic Status. See page 197.

Ictéria vírens virens (Linnæus). Yellow-breasted Chat.

Plate 86.

Note. I am not sure that the chats should be included in the wood warbler family. Once they were placed among the manakins or *Pipridæ*, and they are so different in size, form and structure from the warblers that the few superficial affinities hardly seem to entitle them to a place among the *Compsothlypidæ*. Mr. Aretas A. Saunders tells me that the young are hatched in a naked condition, while all the other warblers with which he is acquainted have natal down. An examination of the osteology and anatomy of the chats in comparison with those of the warblers ought to settle the question. However, in following the American Ornithologists' Union Check-List, we must place the chats here.

Description. — Too large for a warbler, and not resembling other members of the family; bill short, stout, ridge quite convex, unnotched; bristles about mouth fairly developed; wings and tail rounded, about equal in length, tail often slightly the longer. *Adult male in breeding plumage:* Above, bright grayish-olive-green becoming brownish on wings and tail; inner webs of wings dusky; streak from bill over eye, most of lower eyelid and very short narrow streak from base of lower mandible along jaw, white; rest of head olive-green, becoming slaty or blackish below lower eyelid and on lores; from chin to breast and under wing-coverts bright golden-yellow; rest of under plumage white, turning pale gray or olive-brownish or buffy-gray on flanks; under tail-coverts sometimes tinged buffy; wing linings and axillars yellow; bill black or bluish-black, sometimes paling basally below; iris brown; "legs and feet dark blue" (N. S. Goss). *Adult male in winter plumage:* Similar to adult male in spring, but often brighter olive-green above, and flanks and under tail-coverts more buffy or brownish; bill lighter than in spring. *Young male in first winter plumage:* About as adult male in fall and winter, but lores sometimes lighter, more grayish, and plumage a trifle duller. *Adult female in breeding plumage:* Sometimes as adult male, but often duller, yellow below not so bright and lores grayer. *Adult and young female in winter plumage:*

* Mr. Broun has described correctly the usual flight-song of this bird; nevertheless there is an occasional song-flight that goes far beyond the ordinary. I recall but one high-flyer, and probably a high flight is very unusual. One such is described by Miss Florence M. Pease, who wrote to me as follows: "On May 14, 1914, I saw a Maryland Yellow-throat fly very high, then spiral down and then fly off toward the church, where it was still a good distance from the ground. I was not able to estimate accurately how many feet the bird flew up, but I noted that when it began to spiral down it was far, far above the church steeple. I had always supposed that the flight-song of the Maryland Yellow-throat was given from a height of a few feet." E. H. F.

Practically indistinguishable from each other, differing from spring plumage as does adult male in winter (see above) from adult male in spring plumage. *Young in juvenal plumage:* Grayish-brown or brownish-gray above, tinged olive; narrow white line over eye, sides of head grayish and dusky; wings and tail olive-brown edged with brownish-olive-green; below ashy-gray to whitish washed with olive-gray or brownish across upper breast and on sides; "bill and feet pinkish-brown, the former becoming slaty and the latter black" (J. Dwight).

Measurements. — Length 6.75 to 7.50 in.; spread 9.00 to 10.00; folded wing 2.90 to 3.25; tail 2.90 to 3.35; bill .63 to .71; tarsus .95 to 1.00. Female somewhat smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by complete postjuvenal molt (last half of July, August); first breeding plumage by wear; adult winter plumage by complete postnuptial molt (July, early August); adults have only the postnuptial molts and breeding plumage is acquired by wear.

Field Marks. — Larger than Bluebird; olive-green above with white streak over eye; bright rich yellow chin, throat and breast and abruptly white below; *no white in wings or tail;* Yellow-throated Vireo is somewhat similar, but smaller, with conspicuous white wing-bars.

Voice. — Impossible of adequate description; song and calls are all mixed up; an exceedingly eccentric and varied medley of quits, caws, toots, whistles, mews, etc., and in the breeding season some really good music on occasion; sings by daylight, moonlight or starlight (see below under *Haunts and Habits*).

Breeding. — Chiefly in bushy pastures, thickets or brier-patches. *Nest:* In bush, small sapling or tangle of grape-vine, smilax, briers, etc.; often concealed from intruders but not from one who, parting the leaves, peers in; from 1 to 5 feet up, usually about 3 feet; coarse and bulky like that of Catbird; composed chiefly of leaves, grasses, bark-strips, etc., and lined with fine grasses. *Eggs:* 3 to 5, commonly 4; .74 to 1.00 by .60 to .80 in.; varying from nearly oval to short rounded ovate; white, sometimes tinged pinkish or greenish, glossy, distinctly speckled, spotted and blotched with varying shades of reddish and brown, also obscure markings of lavender or lilac (in some cases the latter only), usually a tendency to wreath round large end; figured by E. A. Capen in "Oölogy of New England," Plate V, Figs. 14, 15, and by F. M. Chapman in "The Warblers of North America," Figs. 110–112. *Dates:* May 15 to June 1, Virginia; May 10 to July 2, Pennsylvania; May 23 to July 2, New York; May 18 to June 18, Massachusetts. *Incubation:* Period 15 days (F. L. Burns); by female. One brood yearly.

Range. — Eastern United States and southern Ontario to Mexico and Central America. Breeds mainly in Upper and Lower Austral zones from southern Minnesota, central Wisconsin, southern Michigan, southeastern Ontario, central New York, southern Vermont and northern Massachusetts south to central and southeastern Texas, southern Louisiana, southern Alabama and northern Florida and west to eastern parts of South Dakota, Nebraska, Kansas and Oklahoma; winters from Vera Cruz, Puebla, Guerrero and Yucatan through Central America to Costa Rica; casual in New Hampshire and Maine; not known from the West Indies.

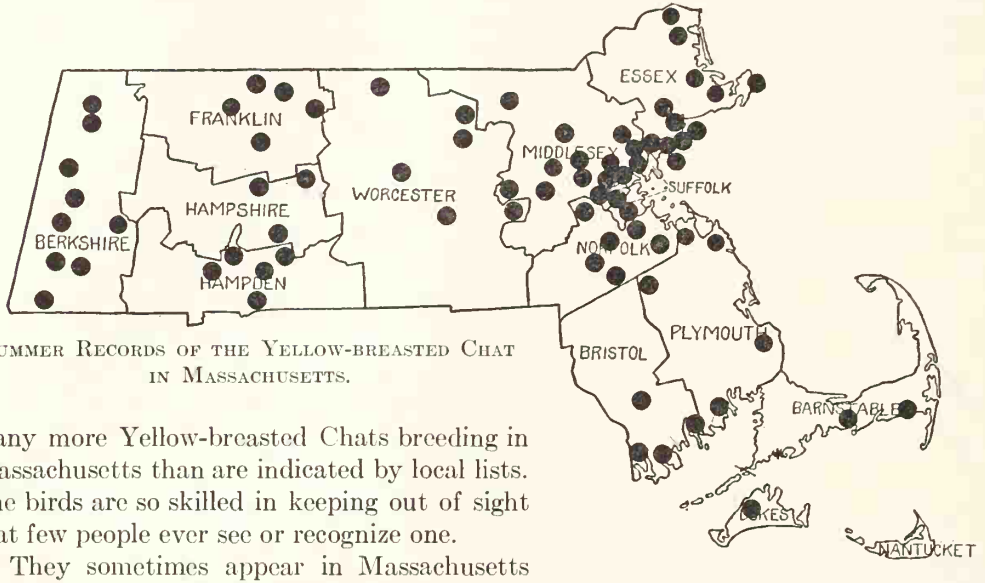
Distribution in New England. — *Maine:* Accidental summer visitor in southern part. *New Hampshire:* Accidental summer visitor in southern part; one authentic record.[1] *Vermont:* Casual in southern part; said to have bred near Bennington. *Massachusetts:* Uncommon to rare local summer resident, chiefly near coast and in river valleys. *Rhode Island and Connecticut:* Locally common summer resident, most common in coastal region.

Season in Massachusetts. — (April 22) May 5 to September 19 (October 26, 27).

Haunts and Habits. My first meeting with the Yellow-breasted Chat occurred when as a boy, wandering idly through an old pasture overgrown with bushes near the shore of Lake Quinsigamond in central Massachusetts, I was assailed by a medley of

[1] White, F. B.: A Preliminary List of the Birds of Concord, New Hampshire, 1924, p. 117.

strange sounds which seemed to move from place to place in the bushes about me, while their author kept well concealed. There were turkey calls, whistles, mews and a rapid succession of notes and phrases, musical and unmusical, and all attempts to identify the singer or even to get a fair look at him were unsuccessful. Finally I sat down quietly among some bushes and began to imitate the cry of a bird in distress. At once a Yellow-breasted Chat dashed almost into my face — caution thrown to the winds. Later I found that this eccentric character was breeding there, as well as at other stations about the city of Worcester, and farther north in the country towns. Doubtless there are



Summer Records of the Yellow-breasted Chat in Massachusetts.

many more Yellow-breasted Chats breeding in Massachusetts than are indicated by local lists. The birds are so skilled in keeping out of sight that few people ever see or recognize one.

They sometimes appear in Massachusetts after the leaves in their favorite retreats have developed sufficiently to furnish excellent cover, of which they immediately avail themselves. They are so furtive at first that their arrival passes unnoticed and how they get here nobody knows. Their ordinary flight is so short and desultory that it would seem that they are not fitted for the extended movements incident to a migration from South America to the northern parts of the United States. Audubon believed that in migration they merely skulked from bush to bush, as is their habit on their breeding ground, and that they traveled night and day.

"However this may be," says Dr. Coues, "no sooner is the ardor of the occasion stimulated by the presence of the females than the gay and gaudy Chats develop those eccentricities that make them famous. They grow too restless to abide the covert they have chosen for their home, and are seen incessantly in motion, flitting with jerky movement from one bush and brier-patch to another, giving vent to long-pent emotions in the oddest notes imaginable. Such a medley of whistling, chuckling, barking and mewing

sounds proceeds from no other bird, unless it be the Mockingbird itself, to whom all possibilities of song are open. During such performances, the Chats seem sedulous to keep concealed, displaying ingenuity and perversity in thwarting our best efforts to catch them at their tricks. The notes, in all their infinite variety, come now from this and now from that spot in the bushes, shifting from point to point as we peer eagerly into the tangled underbrush to catch a glimpse of the tantalizing musician. Such restlessness, and all this variation in the rendering, have much the effect of ventriloquism, and we have not seldom to acknowledge that the Chat has fairly beaten us. But his coloring is brilliant; he has, moreover, a fancy to return again to some particular spot already chosen as his stage; so that if we discover it, and keep so still as not to cause the bird anxiety, nor yet to arouse his ire, we shall most likely see him take his stand again to swell his golden throat afresh with the fantasy of song.

"His nuptial song, I should observe, is something very different from the medley of sounds, not all of which are pleasing, that are heard when each Chat, as one performer in an orchestra, first tunes his curious pipe. Such prelude, after several days' essay, is changed into the rich, voluminous ode with which the bird inaugurates a new order of events, in bursts of almost startling eloquence and fervor. For the nesting-place is fixed upon, the fabric hastens to completion; and the exultant bird, no longer constrained to the lowliness of the coverts, mounts buoyantly from bough to bough of some tall sentinel that guards the leafy undergrowth, to sound his exultation from the very tree-top. Yet once more: the nest now bears its precious burden; the brooding bird assumes her patient place, and presses down her golden breast upon her hopes. Then this strange bird goes fairly wild with joy; he spurns the ground, the favorite singing-post no longer bids him welcome, he rises on the wing, and in mid-air above the nest, with fluttering pinions, down-stretched legs and open beak, he poises, hovers, and performs a thousand antics in the sheer abandon of his eccentricity.

"Such are the Chat's most characteristic actions during the heyday of his life; and when we see him cutting such capers, we may be sure that the nest is not far off." [1]

Mr. C. F. Batchelder relates that "a pair of these birds built a nest in a wren box on the south piazza of a correspondent in Maryland." This piazza partly fronted a ravine. The birds did not seem to be much disturbed by the members of the family, but when the nest building had gone merrily on for nearly a week, the box was blown down. This discouraged them and they never returned.[2]

John Burroughs describes the Chat's interesting personality in "Wake-Robin," his first volume of outdoor essays: "I seldom go the Rock Creek route without being amused and sometimes annoyed by the Yellow-breasted Chat. This bird also has something of the manners and build of the Catbird, yet he is truly an original. The Catbird is mild and feminine compared with this rollicking polyglot. His voice is very loud and strong and quite uncanny. No sooner have you penetrated his retreat, which is usually a thick

[1] Coues, Elliott: Birds of the Colorado Valley, 1878, pp. 318, 319.
[2] Bulletin, Nuttall Ornithological Club, Vol. VI, 1881, pp. 114, 115.

undergrowth in low, wet localities, near the woods or in old fields, than he begins his serenade, which for the variety, grotesqueness, and uncouthness of the notes is not unlike a country *skimmerton*. If one passes directly along, the bird may scarcely break the silence. But pause a while, or loiter quietly about, and your presence stimulates him to do his best. He peeps quizzically at you from beneath the branches, and gives a sharp feline mew. In a moment more he says very distinctly, *who, who.* Then in rapid succession follow notes the most discordant that ever broke the sylvan silence. Now he barks like a puppy, then quacks like a duck, then rattles like a kingfisher, then squalls like a fox, then caws like a crow, then mews like a cat. Now he calls as if to be heard a long way off, then changes his key, as if addressing the spectator. Though very shy, and carefully keeping himself screened when you show any disposition to get a better view, he will presently, if you remain quiet, ascend a twig, or hop out on a branch in plain sight, lop his tail, droop his wings, cock his head, and become very melodramatic. In less than half a minute he darts into the bushes again, and again tunes up, no Frenchman rolling his r's so fluently. *C-r-r-r-r-r, — whrr, — that's it, — chee, — quack, cluck, — yit-yit-yit, — now hit it, — tr-r-r-r, — when, — caw, caw, — cut, cut, — tea-boy, — who, who, — mew, mew,* — and so on till you are tired of listening. Observing one very closely one day, I discovered that he was limited to six notes or changes, which he went through in regular order, scarcely varying a note in a dozen repetitions. Sometimes, when a considerable distance off, he will fly down to have a nearer view of you. And such a curious, expressive flight, — legs extended, head lowered, wings rapidly vibrating, the whole action piquant and droll!"

When the young have been reared and the molting season is past, the chats suddenly disappear on their southward way, and only stragglers are seen as August wanes.

The Yellow-breasted Chat "feeds largely on insects, including beetles, bugs, ants, weevils, bees, wasps, May-flies and various caterpillars, such as tent caterpillars and currant-worms. It is said to be fond of wild strawberries and takes also other wild fruit, as blackberries, raspberries, whortleberries, elderberries, and wild grapes" according to Mr. A. H. Howell.[1]

Economic Status. The Yellow-breasted Chat is not known to injure any of man's products, and undoubtedly it has a share in keeping in check an undue increase of the insect life of its usual haunts.

Wilsónia citrína (Boddaert). Hooded Warbler.

Plate 87.

Description. — A medium sized fly-catching warbler; bill short, little widened at base; bristles about mouth reaching to beyond nostrils; wing moderate, pointed, considerably longer than tail; tail rounded. *Adult male in breeding plumage:* Forehead, fore crown and sides of head masked with rich gamboge or lemon-yellow; rest of head, throat and upper breast hooded with black; elsewhere above

[1] Birds of Alabama, 1924, p. 321.

PLATE 87

PLATE 87

REDSTART
Page 309

Adult Male

Immature Male

Female

HOODED WARBLER
Page 302

Male

Female

CANADA WARBLER
Page 307

WILSON'S WARBLER
Page 305

Male

Male

Female

Female

Allan Brooks.

yellowish-olive-green; wings and tail dusky-brownish-gray with olive-green edgings, and middle wing-coverts broadly tipped olive-green; inner webs of three outer tail-feathers on each side extensively white; lower plumage from black hood to tail bright lemon or gamboge-yellow, tinged slightly olive on upper parts of sides and flanks; under wing-coverts pale yellow or yellowish-white; bill black; iris brown; legs and feet pale flesh-color. *Adult male in winter plumage:* Similar to same in spring, but bill brownish. *Young male in first winter plumage:* Similar to adult male in fall and winter, but chin yellow and usually yellow tips show in black of head and throat. *Adult female:* Similar to adult male, but black of head very variable, duller above and more restricted below, never as black on throat as in male, sometimes entirely absent, and usually replaced on throat, breast and chin by yellow; lores and ear region often marked with dusky. *Young female in first winter plumage:* Similar to adult female and sometimes probably indistinguishable, usually without black, or with very little black about head and throat. *Young in juvenal plumage:* Above rather light brown or grayish-brown, the feathers edged deeper brown; wings and tail similar to adults; wing-coverts edged brown; below, light yellow or whitish, tinged brownish or grayish on throat, breast and sides; "bill and feet pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 5.00 to 5.75 in.; spread 7.90 to 8.50; folded wing 2.50 to 2.75; tail 2.20 to 2.55; bill .48 to .54; tarsus .75 to .78. Female smaller than male.

Molts. — Similar to those of Yellow-breasted Chat (see page 299).

Field Marks. — Slightly smaller than Chipping Sparrow. *Adult and young male:* Unmistakable with *yellow mask, black hood,* olive-green upper parts, bright yellow below, and much white showing in outer terminal parts of spread tail. *Adult and young female:* Like male, but with much less black or none about head and throat and with *yellow forehead.* Young female distinguished from young Wilson's Warbler by white in tail, and from young Canada Warbler by yellow forehead and yellow under tail-coverts, which latter are white in Canada Warbler.

Voice. — Call note a sharp *cheep* accompanied by a flit of the tail (F. M. Chapman); a sharp *tsink* (G. Eifrig); a clear-cut *chirp* sometimes heard after dusk (A. Allison); song, variable — "to my ear the words *you must come to the woods or you won't see me* . . . . exactly fit" (F. M. Chapman); short song, *se-whit, se-wheer,* a longer one, *whee-whee-wheé-a-wheér* (A. Allison); "*tsu-e, tsu-e, tsu-e, tsu-wĕe-tsu*" (W. L. Dawson); *che-reek, che-reek, che-reek, chi-di-ee,* first three notes with a loud bell-like ring, the rest faster with falling inflection; *whee-ree-whee-ree-eeh* (J. H. Langille); *peá-ry peá-ry peé-ah* (G. Eifrig); *weet, weet, weetēē* (T. M. Brewer).

Breeding. — In bushy, swampy lands or well watered woodlands with dense undergrowth; in bushy borders of upland woods, or in hillside thickets of laurel. *Nest:* In bush or sapling from 1 to 5 feet above the ground or water; composed of leaves, bark-strips, weeds, plant-down or similar fibrous material, and lined with fine rootlets, mosses or grasses, pine needles, horsehair, etc. *Eggs:* 3 to 5; .63 to .80 by .43 to .58 in.; ovate to oval; white to creamy-white, spotted and blotched with deep chestnut-red or reddish-brown, purplish-red and pale lilac or lilac-gray, tending to form wreath round large end; figured by E. A. Capen in "Oölogy of New England," Plate VI, Fig. I, and by F. M. Chapman in "The Warblers of North America," Figs. 113–115. *Dates:* April 30 to June 26, South Carolina; May 13 to June 10, Virginia; May 26 to June 16, southern New York; May 27 to June 24, Connecticut. *Incubation:* By female chiefly, the male sometimes assisting. One or two broods yearly, said to have three sometimes in the south.

Range. — Southern Ontario, eastern United States (east of the Plains), Mexico and Central America. Breeds in Upper and Lower Austral zones from southeastern Nebraska, northern Iowa, southern Wisconsin, central Michigan, central and southeastern New York and Massachusetts south to southeastern Texas, southern Louisiana, southern Mississippi, southern Alabama and central Florida and west to eastern Kansas; winters from Vera Cruz and Yucatan to Panama; casual in the Bahamas, Bermuda Islands, Cuba, Jamaica and north to southeastern Ontario; accidental in Maine.

Distribution in New England. — Accidental visitor in northern part; casual in Massachusetts and Rhode Island; sometimes breeding in Connecticut. The records given below are nearly all sight records

and two of them are the first for their respective states, but the bird is practically unmistakable, and the conditions for observation were all that could be desired. Unless references are given these records were sent to me in letters. Records: *Maine:* Falmouth, September 9 and 10, 1904, an adult male, taken on the latter date by Samuel T. Dana;[1] Fryeburg, September 16 to 18, 1917, one pair seen by Miss Harriet Abbott; Gorham, May 18, 1918, one seen by Mrs. Herbert Lombard. *New Hampshire:* North Sandwich, August 22, 1921, bird seen by Mrs. Henry W. Rice and Mrs. Howard L. Hillman, reported by Miss Adelaide Stockwell. *Vermont:* St. Johnsbury, May 28, 1907, pair seen, Mrs. Inez A. H. Griswold.[2] *Massachusetts:* Five records given in Howe and Allen's "Birds of Massachusetts" (1901, p. 101); additional records, Cambridge (Harvard Botanical Garden), September 5, 1901, an adult male seen by Arthur C. Comey;[3] Amherst, May 19, 1909, May 25, 1913, May 21, 1917, single birds seen by Miss Ethel M. Smith; Pigeon Cove, June 20, 1909, a male taken by Charles R. Lamb;[4] Nahant, August 30, 1913, a male seen by George M. Bubier and others;[5] May 17, 1916, and June 2, 1917, single birds seen by C. E. Moulton;[6] Boston (Public Garden), October 2 to 12, 1913, a male seen by various persons, reported by Miss Ida G. Jenkins;[7] Webster, May 23, 1916, a male seen by J. A. Farley; East Longmeadow, May 25, 1920, one seen by Miss Annie K. Rogers and reported by Mrs. J. M. Burt; Tyngsboro, May, 1922, a bird "stayed two days or more," reported by E. R. Davis; Watertown, May 17, 1925, a female and May 23, 1925, a male seen by Mrs. Henry W. Rice and others, reported by Miss Adelaide Stockwell; Westfield, May 5, 1926, one seen by Mrs. R. L. Champlin; Wellesley, October 3, 1927, a male seen by L. W. Smith. *Rhode Island:* Kingston, one female (no data) now in collection of Boston Society of Natural History.[8] *Connecticut:* Uncommon to common summer resident, chiefly in southern or southwestern part.

Season in Massachusetts. — April 19 to October 15.

Haunts and Habits. In the Hooded Warbler we have a peculiar and striking combination of black, green and gold, as well as a lively and engaging bird. Normally it is an inhabitant of the lowlands, preferring well watered woodlands and swampy lands overgrown with bushes, for it is largely a bird of the undergrowth and the lower levels of the trees. My chief experience with it in New England has been in southern Connecticut, but after the breeding season some individuals in their wanderings reach Massachusetts, where I saw one once in the Boston Public Garden (recorded above by Miss Jenkins); at that season of the year the bird is likely to appear in unexpected places, as well as in the spring migration, but it is very rarely seen in Massachusetts in the summer.

In migration it does not seem shy, but usually on its breeding grounds it keeps largely under cover. One must allow, however, for individuality, as some individuals of a usually shy or secretive species may be quite the opposite. Mr. Leander F. Keyser tells of a male that seemed to court his society, was not in the least shy or nervous, and even followed him about for a time.[9]

While searching its native thickets its presence is often revealed as it flutters up above

[1] Journal, Maine Ornithological Society, Vol. VI, 1904, p. 76.
[2] Vermont Bird Club, Bulletin No. 3, 1908, p. 33.
[3] Auk, Vol. XVIII, 1901, p. 397.
[4] Townsend, C. W.: Supplement to the Birds of Essex County, Massachusetts, 1920, p. 168.
[5] Auk, Vol. XXXI, 1914, p. 104.
[6] Townsend, C. W.: Supplement to the Birds of Essex County, Massachusetts, 1920, p. 168.
[7] Auk, Vol. XXXI, 1914, p. 104.
[8] Howe and Sturtevant: Birds of Rhode Island, 1899, p. 82.
[9] In Bird Land, 1894, pp. 146, 147.

the bush-tops, or darts out after some passing insect. Its sweet song, which it utters frequently during the daylight hours, carries far, and reveals its presence to the passer-by. It has at least two main songs, very unlike, and some variations. While singing it frequently opens its tail and when in the air it opens and closes it, thereby "flashing" the large white terminal spots.

In the southern Connecticut Valley it breeds not rarely in laurel thickets on wooded hillsides. Most collectors have recorded some difficulty in finding the nest, as it is usually in a dense thicket, but Professor E. H. Eaton says that he finds it easily by placing the eye close to the ground where he can look through the shrubbery "from below the cover of the undergrowth."[1] The nest, usually one to three feet from the ground, can then be seen, having the appearance of a bunch of leaves.

The home life of this warbler seems to be little known, and I have never had an opportunity to observe it sufficiently. Both parents are devoted to their young and to one another, and sometimes will approach very close to a person disturbing the nestlings, and attempt to lead him away. Mr. Aretas A. Saunders, writing to me, says that he saw a pair of these birds acting as if their nest was near-by, but he could not find it. He stayed to eat his lunch, and as he finished and was about to rise, the male bird suddenly dropped to a low bush and then flew directly at his head; as Mr. Saunders dodged, the bird's wing brushed his face. This seems remarkable, as this bird usually seems to be of a gentle disposition, though some rival males fight fiercely in the mating season.

Dr. John Bachman related a striking instance of conjugal devotion. He said that while a pair of these warblers were building their nest, a Sharp-shinned Hawk captured and bore off the female, when the male, following the hawk closely, darted at it from all directions and continued to do so, until both were out of sight.

In late July when the young have been reared and have donned their winter plumage, most of the Hooded Warblers begin to leave their northern homes for the long journey to Mexico or Central America; some individuals continue to wander about in the north through August, and some of the males have a second song period during that month.

Little is known of the food of this bird. Grasshoppers, locusts, caterpillars and plant-lice are taken by it, and it takes many small insects upon the wing, but what they are we know not.

Economic Status. See page 197.

Wilsonia pusilla pusilla (Wilson). Wilson's Warbler.

Other names: WILSON'S BLACK-CAP; BLACK-CAPPED YELLOW WARBLER.

Plate 87.

Description. — A small fly-catching warbler; bill short, somewhat widened at base; bristles about mouth reaching beyond nostrils; wing moderate, pointed, tail rounded, both about same length. *Adult male in breeding plumage:* Forehead, sides of head (except ear region), and lower plumage lemon or gamboge-yellow, sides and flanks washed with olive-green; top of head glossy black; elsewhere above

[1] Birds of New York, Part II, 1914, p. 460.

olive-green which extends forward over ear region, where it becomes more yellowish; wings and tail brown, the feathers edged olive-green, under wing-coverts chiefly yellow; bill dark brown or dusky, becoming blackish at end, lighter below; iris brown; legs and feet flesh-color. *Adult male in winter plumage:* Similar to same in spring, but feathers of back part of black cap sometimes narrowly tipped olive. *Young male in first winter plumage:* Similar to adult male in fall and winter but black cap more veiled with wider olive tips. *Adult female in breeding plumage:* Similar to or as male, but usually the black of cap either much restricted or largely veiled by olive. *Adult female in winter plumage:* Similar to adult female in spring. *Young female in first winter plumage:* Nearly as adult female, but black cap lacking or concealed. *Young in juvenal plumage:* Above hair-brown or olive-brown, sometimes mottled with darker; wing-coverts edged with brownish-white or buffy forming two light wing-bars; wings (elsewhere) and tail much as in adults; below, forward parts brownish, becoming yellowish on after parts.

Measurements. — Length 4.25 to 5.10 in.; spread 6.75 to 7.00; folded wing 2.00 to 2.35; tail 1.90 to 2.30; bill .40 to .45; tarsus .65 to .70. Female smaller than male.

Molts. — Apparently similar to those of Kentucky Warbler (see page 287); not enough specimens from Mexico or Central America to determine whether adults molt in spring.

Field Marks. — Smaller than Chipping Sparrow; our only warbler yellow below with black cap; viewed from the side the black cap appears like a black stripe high over the eye. Female and young may show only a trace of the black cap or none, but have *sides of head yellow*, and *ear region olive-green.*

Voice. — Calls, a *chip*, a *chuck*, and some harsh notes resembling *zee-zee-zee-zee* (H. D. Minot); "a very fine quick lisp"; commonest song, "a rapid, bubbled warble of two nearly equal parts, the second lower-toned and sometimes *diminuendo*" (G. H. Thayer); it has a number of variations, sometimes only the first half is given, and occasionally it is given on the wing; variations, *t'le, t'le, t'le, t'le, chee chee chee;* "a full chord-like *chee-chee-chee,* followed by a Goldfinch-like trill" varied somewhat as to the trill (Mrs. J. V. Farwell, Jr.).

Breeding. — Usually in swampy bushy land such as a tamarack bog or a swampy run. *Nest:* On ground, or sunken in it; usually among bushes, such as alders or smaller shrubs; constructed mainly of grass, lined with finer grass and a few hairs. *Eggs:* Usually 4; .58 to .67 by .45 to .51 in.; ovate; white, marked with reddish-brown dots or spots and splashes of light brown or reddish-brown, with sometimes other browns or lilac-gray, or a wreath of dark brown spots around the large end; figured by E. A. Capen in "Oölogy of New England," Plate VI, Fig. 2. *Dates:* June 6, New Hampshire; June 1 to 19, southern Maine. *Incubation:* By female. One brood yearly.

Range. — Eastern and central North America (west to the Rockies) to Central America. Breeds in Hudsonian and Canadian zones from tree limit in northwestern and central Mackenzie, northern Manitoba, northern Ontario, central Quebec (southern Ungava), southern Labrador and Newfoundland south to central-eastern British Columbia, southeastern Alberta, southern Saskatchewan, central Minnesota, southeastern Ontario, southwestern Quebec, northern New Hampshire, southeastern Maine, southern New Brunswick and Nova Scotia; in the southeastern United States migrates mainly along the Alleghanies; very rare in the Lower Austral Zone from Virginia to Louisiana; winters from southern Mexico to Costa Rica and occasionally north to southern Texas; casual in Alaska, Colorado, Washington, Oregon, New Mexico and Lower California; accidental in Barbados Island.

Distribution in New England. — *Maine:* Uncommon migrant; summer resident south to Bangor and Pittsfield. *New Hampshire:* Uncommon migrant; rare local summer resident in northern part. *Vermont:* Uncommon migrant; reported in summer. *Massachusetts, Rhode Island and Connecticut:* Uncommon migrant.

Season in Massachusetts. — May 5 to June 1; August 23 to September 27 (November 2, 18, 20, 27, 30, December 1, 2, 3, 8, 25, 30).

Haunts and Habits. Among the least and lowliest of our warblers, the pretty little Wilson's Warbler is a marked bird, because of its black cap. Both adult male and female

show this cap, though in spring females it is not usually so prominent as in the male, and the young in autumn show little if any trace of it. The bird is quick, active and energetic, nearly always busy in excited pursuit of its small game, which it often follows and catches on the wing, snapping its bill in the manner of a flycatcher. The little bird has spells of excessive tail-twitching, with a sort of rotary motion, which perhaps expresses its emotion, as it does not sing very much in migration; this is sometimes accompanied by much flipping of the wings, such as is common with kinglets.

I have found it almost invariably in bushes near water, where dense willows grow, on roads leading through swamps or on swampy, shrubby lands, but at this season it may be found elsewhere occasionally, in upland deciduous or coniferous woods, in orchards or even in city gardens or parks. It is normally a bird of the shrubbery, the weed patch, and the lower branches of trees near woodland waters and in bushy bogs. The alder copse is one of its favorite haunts. It usually arrives in Massachusetts about the middle of May, and departs for the north before the end of the month. The southward migration begins in August, and all but a few delayed stragglers have left New England before September ends.

We know little of the food of Wilson's Warbler. It feeds largely on small insects, flies, gnats, plant-lice, small caterpillars and other larvæ, small grasshoppers, etc., and spiders, but no careful analysis of its food has been made.

Economic Status. See page 197.

Wilsonia canadénsis (Linnæus). Canada Warbler.

Other names: CANADIAN WARBLER; CANADA FLYCATCHER.

Contributed by Maurice Broun.

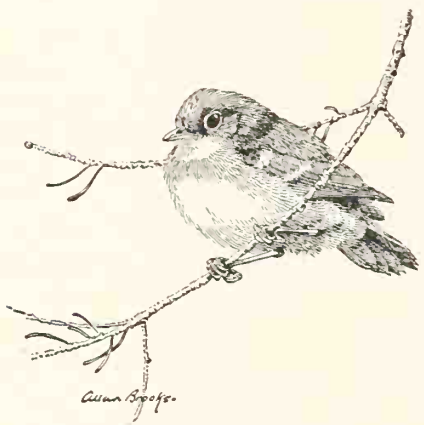
Plate 87.

Description. — Bill about half the length of head; bristles about mouth well developed; wings rather long and pointed. *Adult male in breeding plumage:* Forehead chiefly black, occasionally with a yellowish center line, more or less distinct; crown slate-gray, spotted with black; back of head, rear part of sides of head, hind neck, back, wing-coverts, rump and upper tail-coverts slate-gray; wings and tail browner, wing-feathers edged with gray; stripe from nostril over lores to eye, eye-ring and under plumage yellow; under tail-coverts white, sometimes tinged with yellow toward vent; patch on lores extending below and behind eye and passing as a streak down sides of neck, black, which also runs brokenly across upper breast in a series of spots or broken streaks; "bill blackish-brown above, pale vinaceous-drab below (darker at tip); tarsi light ochraceous-drab" (F. B. White); iris clove-brown; "feet pale yellowish-brown" (Allan Brooks). *Adult male in winter plumage:* Similar, but back faintly washed with olive-green. *Young male in first winter plumage:* Resembles adult female, from which it is almost indistinguishable. *Adult female in breeding plumage:* Similar in pattern to adult male, but duller; forehead and crown often tinged with olive-yellow, with little or no black; region below yellow loral stripe and eye-ring, dusky-olive-gray, sometimes extending to lower part of sides of neck; breast less heavily spotted or streaked with dusky or olive; bill, iris and feet as in male. *Adult female in winter plumage:* Similar to same in spring, but slightly tinged olive-green above. *Young female in first winter plumage:* Similar

to preceding, but upper plumage, especially crown, may be tinged with olive-brown, and markings on breast much fainter. *Young in juvenal plumage (sexes alike)*: Almost identical with young of Wilson's Warbler.

Measurements. — Length 5.00 to 5.75 in.; folded wing 2.50 to 2.65; tail 2.23 to 2.48; bill .45 to .52; tarsus .65 to .71. Female slightly smaller than male.

Molts. — Juvenal plumage succeeds natal down by complete postnatal molt; first winter plumage acquired by partial postjuvenal molt (late June, July) involving body plumage and wing-coverts; first breeding plumage assumed after a partial molt affecting chiefly head, chin and throat, but not rest of plumage; adults have complete postnuptial molt annually (late June, July); breeding plumage probably acquired by wear.



Canada Warbler, Juvenile.

Field Marks. — Only New England warbler that is plain gray above, without white markings on wings or tail. *Male:* Unmistakable; well-defined necklace of black spots or streaks across yellow breast. *Female:* Duller than male, necklace less heavily marked and less distinct, but always discernible. *Young:* Resemble female, but necklace sometimes barely visible, and upper plumage tinged more or less brownish, being most noticeable on head.

Voice. — Alarm notes, a sharp *chip, chiek* or *chuck;* song, a sweet warbling utterance, loud and animated, and unlike song of any other warbler; difficult to describe because of its variations, but the following renditions are suggestive: *tu tu tswe tu tu,* the long syllable being higher pitched (Lynds Jones); *te chit a wit, te chit a wit, tehe tche* (H. D. Thoreau); a loud and striking *rup-it-chee, rup-it-chee, rup-it chitt-it-lit* (E. S. Thompson); *t'le we, t'le we, t'le we, t'le we, t'l it wit,* often begins with a little whirr or snap (Mrs. J. V. Farwell, Jr.).

Breeding. — In cool, moist woodlands or wooded swamps, of deciduous or mixed growth. *Nest:* On or near the ground, usually well concealed, among rank fern growths, beneath bushes or logs, in grassy tussocks, on upturned tree roots or banks and in mossy situations in general; built of dried leaves, grass, moss and strips of bark, and lined with fine rootlets and hairs; fern-down often used in construction. *Eggs:* 4 or 5; .60 to .73 by .48 to .55 in.; ovate; white or buffy-white, speckled with reddish-brown or lilac, chiefly around larger end, and sometimes marked with a few blackish specks; figured by E. A. Capen in "Oölogy of New England," Plate VI, Figs. 3, 4, and by F. M. Chapman in "The Warblers of North America," Figs. 119–121. *Dates:* June 1 to 20, New York; June 9 to 26, Massachusetts; June 9 to 13, New Hampshire. *Incubation:* No data. One brood yearly.

Range. — Eastern and central North America (west to the Canadian Rockies) and south to central South America. Breeds in Canadian and Transition zones from north-central Alberta, central Saskatchewan, central Manitoba, northern Ontario, southern Quebec and southern Labrador south to central Minnesota, central Wisconsin, central Michigan, southeastern Ontario, southern New York, northern New Jersey, southern Connecticut and Rhode Island and in the mountains from Pennsylvania to western North Carolina, eastern Tennessee and northern Georgia; in migration west to eastern North Dakota, eastern Nebraska, eastern Kansas, western Oklahoma, central Texas and eastern Mexico (Tamaulipas to Chiapas) and southeast to Florida; winters from northern Colombia to Ecuador, central Peru and (casually) in Guatemala; accidental in Colorado and Greenland.

Distribution in New England. — Common migrant over entire region; rather common local summer resident in Maine, New Hampshire, Vermont and western Massachusetts, becoming uncommon to rare local summer resident in central and eastern Massachusetts, Connecticut and Rhode Island.

Season in Massachusetts. — (April 10) May 9 to September 29.

Haunts and Habits. This charming little bird is one of the most handsome and most musical of our New England warblers. It is not as strikingly colored as some of the others, but its simple beauty consists in the exquisite ornament of a heavy jet necklace across its yellow breast. The Canada Warbler vents its good spirits in lusty, rippling, much reiterated warbling notes that have scarcely any semblance to the sibilant utterances of most of its congeners, but suggest rather the songs of the Goldfinch and Canary.

During migration this sprightly bird consorts freely with other warblers, but upon reaching its breeding grounds in the north, it becomes rather solitary, and resorts to the cool, deep, moisture-laden forests, carpeted and draped with mosses, and abounding in dense tangles and coverts. Here it fulfills nature's requirements, erecting and concealing its loose, bulky nest in some depression in the ground among clumps of lush ferns or other vegetation.

The Canada Warbler habitually forages among shrubbery and the lower limbs of trees, seldom venturing to the higher tree-tops. In this and in many other habits it resembles its nearest relative, the Wilson's Warbler. Early writers always referred to it as the "Canada Flycatcher," because of its expertness in catching insects on the wing. Its fly-catching propensities are often manifest, but the bird also gleans its prey from leaf and twig, and occasionally from the ground.

This warbler is typical of the Canadian fauna, but it occurs, nevertheless, as an occasional summer resident in suitable localities in eastern Massachusetts, becoming very local south of this region. A pair of these birds recently nested for several successive seasons in an isolated, swampy woodland within seven miles of Boston.

The food habits of the Canada Warbler are essentially like those of its allies. It indulges its eager appetite on winged insects, such as mosquitoes, flies and moths, while beetles, small hairless caterpillars and spiders also form a part of its fare.

Economic Status. See page 197.

Setóphaga ruticílla (Linnæus). **Redstart.**

Contributed by Maurice Broun.

Plate 87.

Description. — Bill rather broad at base, wedge-shaped in profile as seen from above or below, and conspicuous bristles about mouth; wings rather long and pointed; tail slightly rounded, its feathers broad. *Adult male in breeding plumage:* Head, neck, back, throat and upper breast deep lustrous black; two central pairs of tail-feathers (sometimes only one pair) and broad terminal band across tail black, rest of tail pale orange or salmon-pink; wings black, with broad orange or orange-red band crossing basal part of flight-feathers (except two innermost); sides of breast and under wing-coverts bright orange-red; rest of underparts white, usually with black of breast extending to outer borders of the orange-red lateral patches; under tail-coverts sometimes partly black or dusky; bill wholly black in spring and summer, more brownish in fall and winter; iris brown; legs and feet brown, brownish-black or blackish. *Adult male in winter plumage:* Similar, but black on throat and head more lustrous, and feathers of back some-

times tipped with brown. *Immature male in first breeding plumage:* Closely resembles adult female in breeding plumage, from which it is sometimes indistinguishable, but feathers of breast, chin, lores, cheeks, and crown usually dusky or mottled with black; winter specimens often have back brownish-olive or olive, and yellow on sides of breast somewhat richer in color; exact period for acquisition of full plumage not definitely known, but generally considered to be two years. *Adult female in breeding plumage:* Crown, cheeks and hind neck plain mouse-gray; back, shoulders and rump plain light olive or grayish-olive-green; upper tail-coverts, two central pairs of tail-feathers (sometimes only one) and broad terminal band across tail dusky, rest of tail light yellow; wings dusky (not so dark as dusky part of tail) with light olive edgings, and with orange bar of the male replaced by yellow (except on two innermost secondaries) but more restricted, often not showing on primaries; lores and line over eye paler than crown; chin, throat and chest dull grayish-white; rest of under plumage whiter, with conspicuous patch of yellow on each side of breast extending over wing linings; middle of breast, together with sides and flanks, sometimes tinged with yellow; bill dark brown or brownish-black in summer, pale brown in winter; iris, legs and feet as in adult male. *Adult female in winter plumage:* Similar, but back often more olive, throat and breast tinged with light straw-color. *Immature female:* Similar to adult female in winter plumage, but head and neck brownish-gray; yellow on sides of breast less distinct; less yellow in wing, sometimes entirely concealed when wing is closed. *Young in juvenal plumage:* Above plain grayish-brown; throat and upper breast similar but grayer, becoming grayish-white or yellowish-white on abdomen; wings and tail as in older birds, but middle and greater wing-coverts tipped with dull white or pale yellowish; no yellow on sides of breast.

Measurements. — Length 4.60 to 5.75 in.; folded wing 2.40 to 2.57; tail 2.27 to 2.45; bill .43 to .49; tarsus .62 to .66. Female averages smaller than male.

Molts. — Nestling passes into juvenal plumage after a complete postnatal molt; first winter plumage acquired by partial molt (July, August) which affects body plumage and wing-coverts; first breeding plumage acquired by partial molt (March April) involving chiefly head and throat, where in male a few black feathers appear; this molt much more restricted in female; according to Dr. Jonathan Dwight, black and orange coloration of adult male is assumed after complete postnuptial molt (July) when adult winter plumage is attained; adult breeding plumage acquired by wear.

Field Marks. — *Adult male:* The striking pattern of orange-red and black separates this bird from any other bird of its size. *Adult female and young:* Black of adult male is replaced by grayish and olive-green or olive-brown, and orange-red by conspicuous yellow, with little change in pattern, which is distinctive enough to prevent confusion. Young males in this plumage vary considerably in the amount of black. In any plumage the Redstart may be recognized by its habit of frequently spreading its tail, which appears rounded and fan-shaped, the broad terminal band and central tail-feathers forming a broad, rounded T.

Voice. — Alarm note, a sharp *chip* or *chick;* song, very often difficult to distinguish from that of the Yellow Warbler, because of the close similarity in tone and quality, but as Ralph Hoffmann points out "it is sharper, more insistent and less complicated, and the phrases are generally on the same pitch, not ending as in that of the Yellow Warbler with a second phrase at a different pitch." A common song is a simple lisping repetition of the syllables *che-wée-o* or *che-wée-o-wée-o,* or a soft *wée-see-wée-see-wée,* constantly varied (H. D. Minot); *ehe ehe ehe che-pa,* the last syllable abruptly falling and weakening (F. L. Burns); *tsé-tse, tsé-tse, tsé,* emphasis on the last syllable (H. D. Thoreau); the well-known *ching ching, ehee, ser-wee, swee, swe-e-e* (F. M. Chapman).

Breeding. — In orchards, in saplings bordering on pastures, woodlands (either deciduous or mixed), and even in shade trees and shrubbery about dwellings. *Nest:* In upright crotch of a tree, sapling or bush, from 3 to 35 or more feet up; a firm compact compilation of grasses, strips of bark, plant fibers, plant down and spiders' webs, all neatly interwoven together; lined with rootlets and grasses, hairs, and occasionally a few feathers. *Eggs:* 3 to 5, commonly 4; .56 to .70 by .46 to .51 in.; ovate; varying from creamy-white to grayish-white, seldom with a greenish tinge, delicately sprinkled with lilac, purple,

cinnamon-brown or reddish spots, often heavily blotched or wreathed with brown at larger end; figured by E. A. Capen in "Oölogy of New England," Plate VI, Fig. 5, and by F. M. Chapman in "The Warblers of North America," Figs. 122–124. *Dates:* May 20 to June 27, Connecticut; May 29 to June 21, Massachusetts; June 2 to 30, Maine. *Incubation:* Period 12 days, sometimes 14 (O. W. Knight); by female. One brood yearly. (See Fig. 83.)

Range. — North America (except extreme north), Central America and northern South America. Breeds in Canadian, Transition and Upper Austral zones from Pacific coast in southeastern Alaska, northern British Columbia, central-western Mackenzie, southern Manitoba, northern Ontario, central-western and southeastern Quebec and Newfoundland south to northeastern Oregon, central-western Idaho, northern Utah, Colorado, central Oklahoma, southeastern Texas, northern Louisiana, southern Alabama, southern North Carolina and (casually) southern Georgia; casual in migration in California, Arizona and New Mexico; winters from southern Lower California, Puebla, Vera Cruz and (casually) southern Texas through Central America to Ecuador, Colombia, central Venezuela, Trinidad and French Guiana and from the Bahamas and Cuba through the West Indies; accidental in northern Labrador and the Bermuda Islands.

Distribution in New England. — Common migrant and summer resident throughout the six states, except on higher altitudes (absent above 3,000 feet in New Hampshire).

Season in Massachusetts. — (April 13 to 30) May 3 to October 12 (November 1).

Haunts and Habits. Every bird lover has at some time been asked "Of all the warblers, which one is your favorite?" And he has probably answered — the Redstart! Of all that brilliant galaxy of warblerdom, dainty little birds, prim in form and kaleidoscopic in plumage, the Redstart stands preëminent. Though some may choose that animated sunbeam, the Yellow-bird, the Maryland Yellow-throat because of its quaint manners and captivating domino, the gorgeous Blackburnian, or any other of the gayly clad tribe, none of these possesses the distinctiveness of the "*Candelita*." As Dr. Frank M. Chapman tells us, this is the happy title the Cubans have conferred upon the Redstart, in distinction from most of our warblers, which are known simply as "*Mariposas*"— butterflies. The pleasing harmony of black and flame color in this "little torch" is a delight to the eye, and as one writer has expressed it, the bird is "a constant source of pleasure to even the most blasé observer." A pent-up bit of feathered energy, ever nervous and vivacious, the Redstart darts and flutters about the sylvan verdure like a tongue of flame. As it whirls and dashes up and down, around and about, in skilful pursuit of its fated insect victims, one is not only fascinated by its wild antics, but also by its vivid display of orange-red, as the wings and tail spread, contract and flash.

Like a few other warblers, the Redstart exhibits a superficial affinity to the flycatchers. It has prominent bristles about its mouth, and like these last named birds, it is expert in pursuing and capturing insects in the air. But the Redstart could never sit sedately and wait for some obliging gnat to pass by ere it tickled the bird's gullet. No, he is a restless, harum-scarum sort of fellow, and could hardly keep his wings folded twenty seconds. His mate, however, is constrained to some degree of inactivity when it is necessary that she incubate her beautiful gem-like eggs. Not only from the air does the bird glean insect sustenance, but from bole and bough and leaves, and sometimes from the ground.

Although this bird has a preference for low sapling growths in which to nest, it is just

as much at home in more or less heavily wooded areas, chiefly deciduous, and sometimes comes to nest in orchards and about dwellings. The nest is customarily built in an upright crotch, but the bird may stray from orthodox standards. An interesting deviation is recorded by Mr. George C. Embody, who found a *pensile* Redstart's nest. It was suspended between two twigs at the end of a small limb, much in the manner of a Red-eyed Vireo's nest.[1]

A very odd nesting location is described by Miss Annie Lyman Sears of Waltham, Massachusetts, in Chapman's "Warblers of North America," p. 292. A pair of Redstarts built their nest on the bracket above a Venetian ironwork lantern hanging before the front door of her home. The parents raised a brood of five young, and became very tame, to the point of nearly alighting on the inmates of the house.

The tasks of home-building and incubation are executed by the mother bird, but when the young hatch, the father shares interest, and both parents become ceaselessly engaged in filling the hungry mouths of their offspring. The Redstart is one of the most frequent victims of that insidious parasitic scourge of many of our warblers and other small birds, the Cowbird. Consequently each year much time and effort is uselessly expended by this bird in nesting developments, made abortive by the intrusion of a Cowbird's egg. Either the whole affair is abandoned, or else the poor little mother adopts the unwelcome addition to the family, which proves a perfect glutton in consuming most of the food brought to the nest, and often actually crowds out the rightful progeny.

Many a bird student has racked his brain in an honest endeavor to discriminate between a song of this species and that of the Yellow Warbler. The Redstart's song is so constantly varied that it would be difficult indeed to catalogue the several variations, whether reduced to musical notation or syllabification. But the keen ear soon learns to detect the normal differences between the songs of the two species, already given above in Hoffmann's clear and succinct analysis, under the section on *Voice*. Young males sing rather crudely until the first autumn, when, garbed like their mothers, they sing with the same ease and flexibility as their fathers.

"It is impossible to weigh the *pros* and *cons* of this bird's food," wrote Mr. Forbush in 1907, "for no thorough examination of it has ever been made. It is an efficient caterpillar hunter, and one of the most destructive enemies of the smaller hairy caterpillars. It catches bugs, moths, gnats, two-winged flies, small grasshoppers and beetles. It probably secures a larger proportion of parasitic hymenoptera and diptera than most other warblers, occasionally destroying a few wasps; otherwise, its habits seem to be entirely beneficial." [2]

Economic Status. Anyone who is familiar with the Redstart's superabundant energies as an insect gleaner will appreciate its economic importance. It is fortunate that this bird is common.

[1] Osprey, Vol. III, 1898, p. 61.

[2] Useful Birds and Their Protection, 1907, p. 198.

[Note. As the Redstart actively attacks not only hairless caterpillars of the forest and orchard, but such hairy pests as the gipsy, brown-tail, tent and forest tent-caterpillars in their early stages, it seems to be a particularly useful bird in New England. E. H. F.]

Family **MOTACILLIDÆ.** Wagtails.

Number of species in North America 7; in Massachusetts 1.

Wagtails (including pipits) are song birds with rather short, slender bills, exposed nostrils, long pointed wings with only *nine primaries*, long inner secondaries, rather long or very long tail rounded, double rounded, or nearly even, with rather narrow feathers, long slender feet and long hind claws (except in one genus). They are chiefly terrestrial, walking upon the ground, and all have a habit of wagging the tail up and down. The wagtails are birds of bright or striking colors, and are confined almost entirely to the Eastern Hemisphere. The pipits are plainly colored birds.

Ánthus rubéscens (Tunstall). **Pipit.**

Other names: titlark; wagtail.

Plate 88.

Description. — Bill short, slender, conical, nearly straight, slightly notched at tip; nostrils exposed, few short bristles about mouth; wings longer than tail, first four primaries forming tip, 5th abruptly shorter; tail rather long, slightly notched; legs and feet rather slender, hind claw quite as long as the toe, and somewhat straightened. *Adults in breeding plumage (sexes alike, but much individual color variation)*: Above grayish-brown or grayish-olive-brown (some individuals more grayish than others); feathers of top of head, back and scapulars with obscure dusky shaft-streaks; wings and tail dusky-brownish with buffy edgings; middle wing-coverts margined at ends with pale grayish-buff to whitish; outermost tail-feathers on each side with outer web, shaft and nearly all terminal half of inner web white, next feather on each side with some white terminally, third feather sometimes marked with white at tip; ear region colored chiefly like upper parts; sides of head and sides of neck (chiefly) and lower plumage varying from pinkish-buff to vinaceous-buffy-cinnamon; a dark grayish-brown line behind eye, a pale pinkish-buff stripe above it; upper breast, sides and flanks usually more or less streaked dusky, but sometimes unstreaked; wing linings like breast or paler; bill brownish, becoming blackish on ridge and tip; iris brown; legs and feet usually blackish or dark brownish, feet sometimes darker than legs. *Adults in winter plumage:* Similar to same in spring plumage, but may be much browner or more olive above, and much paler and more heavily streaked below; bill mostly straw-color below; legs brown, feet dark brown, soles greenish-yellow. *Young in first winter plumage:* Similar to adults in autumn and winter. *Young in juvenal plumage:* Above chiefly hair-brown, similar to winter adults, but more heavily marked with dusky on back and scapulars; wings and tail brown, the feathers edged lighter brown; outermost pair of tail-feathers nearly all white, second pair with some white; indistinct stripe above eye and ring around it buffy-white; below cream-buff streaked more darkly and broadly on breast than in adults.

Measurements. — Length 6.00 to 7.00 in.; spread 9.95 to 11.00; folded wing 3.15 to 3.60; tail 2.45 to 3.00; bill .49 to .60; tarsus .60 to .90. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September) involving body plumage chiefly; first breeding plumage by partial prenuptial molt (April) involving most of body plumage; adult winter plumage by complete postnuptial

molt (July to September); adult breeding plumage by partial prenuptial molt (February to April) including body feathers, some wing-feathers and some tail-feathers.

Field Marks. — Size, slightly larger than Song Sparrow, but more slender, with *slender bill;* a brown or brownish-gray bird, buffy below, inconspicuously marked; walks or runs on the ground with tail constantly tilting or see-sawing; flight erratic, wavering, often showing white on two outer tail-feathers on each side, and thus might be mistaken for a Vesper Sparrow; sometimes alights on roofs, wires, boulders, sticks or even trees. Pipits are smaller and more slender than Horned Larks, and in flight show more white on tail.

Voice. — Call, a shrill *tsee-tseep tsee-tsee-tseep,* much like that of Horned Lark (R. Hoffmann); *pip-it* or *tsee-ket;* on breeding grounds a loud whistling *tswit,* also a *churr* like that of the Redpoll; flight-song *che-whee, che-whee* repeated up to 48 times (Townsend and Allen); sometimes sings on the ground.

Breeding. — On barren, open, treeless lands of Hudsonian and Arctic zones. *Nest:* On ground, on side of a rock, in a hollow in moss, or in crevice in chasm; bulky and composed chiefly of grass. *Eggs:* 4 to 6; .75 to .80 by .58 to .62 in.; ovate; bluish-white to light brown, thickly spotted with chocolate-brown, color varying to chocolate, lined and streaked with black. *Dates:* June 18, Ungava; June 25, northern Mackenzie. *Incubation:* By both sexes; period unknown. One brood yearly.

Range. — North America and Central America. Breeds in Arctic Zone from northern Alaska, northern Yukon, northern Mackenzie, Baffin Island and central-western Greenland south to the Aleutian Islands, central-southern Alaska, southern Mackenzie, northern Manitoba, northern Ontario, southern Quebec and southern Newfoundland, and on high mountains south to northern California (probably), north-central Arizona (probably) and northern New Mexico; winters from southern British Columbia, northern Nevada, central New Mexico, northern Arkansas, southern Illinois, southern Pennsylvania, northern New Jersey, Long Island (New York), southern Connecticut and northeastern Massachusetts (casually) south to southern Louisiana, southern Alabama, southern Florida and through Mexico to Guatemala; casual in the Bermudas; accidental in Heligoland and St. Kilda Island (Scotland).

Distribution in New England. — Uncommon to rare spring, and locally common fall migrant, most common coastwise and in river valleys, least common in Vermont.

Season in Massachusetts. — April 18 to May 20 (June 2, 8); August 29 to November 28 (winter).

Haunts and Habits. Down from the wastes of Greenland, the rocky coast of Labrador and the barrens of Newfoundland come the Pipits in September to the windswept hills and pastures along the New England shores. Marsh and moor are enlivened by their restless vacillating hosts, until the frosts of late October and November send them on their way. Again we may see a few individuals here and there in April, but the majority seem to pass northward west of the Alleghanies, and the bird is not common here in spring. Its two-syllabled call-note is supposed to resemble the word *pip-it,* and so has given the bird its name.

This modest little wanderer is not a conspicuous bird. Seen in the short grass with Savannah Sparrows and other small birds of the fields, it might be taken for one of them and overlooked. It has no bright colors, no conspicuous markings, except the white in the tail, which is concealed when that member is closed, and no striking notes. When it rises, its flight is undulating and erratic, like that of sparrows, and then only the white in the outer tail-feathers serves to distinguish it from all but the Vesper Sparrow. When it alights on plowed ground (a common habit) it so closely matches the soil in color that it is almost invisible. It walks or runs, while sparrows usually hop.

The Titlark, as it is often called, is a bird of the open spaces. Barren rocks, sand-

PLATE 88

PLATE 88

MOCKINGBIRD
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CATBIRD
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MALE

MALE

BROWN THRASHER
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MALE

PIPIT
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MALE IN SPRING

MALE IN AUTUMN

Allan Brooks.

dunes, beaches, salt-marshes, wide meadows and cultivated lowlands are some of its favorite resorts. It is fond of the water, and frequents the sea-coast and the valleys of streams or the shores of lakes. In the interior a plowed meadow with a small brook running through it often attracts a flock of Pipits. Their actions about the water somewhat resemble those of a Water-Thrush, as they walk into the water with teetering tails, but they are never heavily streaked on the breast like the Water-Thrush. In the lakes, they sometimes alight on large rocks, where they find food amid the moist rock vegetation at the water's edge. Usually while feeding they run or walk along the ground, searching for insects and other small forms of animal life, almost constantly moving the tail. A flock in flight resembles a flock of Horned Larks, having a similar undulating movement, and similar notes, but the birds show more white in the tail. They fly in loose order and rather fitfully, but they are powerful fliers and their evolutions in flock formation often are graceful and sweeping. When moving about singly in flight, they seem always uncertain what to do next, whether to go here or there, to alight or go on. When they alight, as they do occasionally, on the ridge-pole of a building, a telegraph wire, or a naked tree, they become conspicuous and may readily be distinguished from sparrows by their slender bills. They fly in flocks of from ten to one hundred or more, but often scatter over a wide area to feed, and when approached under such conditions jump up from the grass singly or a few at a time.

The food of the Pipit consists largely of insects, small molluscs and crustaceans, small seeds and wild berries. More than 77 per cent of its food has been found to consist of insects, of which over 64 per cent are injurious. The seeds are chiefly weed seeds and waste grain.[1] Professor Aughey found an average of 47 locusts and 4 other insects in the stomachs of some Nebraska specimens.[2] The Pipit takes weevils, bugs, grasshoppers, crickets, plant-lice and spiders. It renders valuable service to the cotton growers of the South by destroying boll weevils. Examination of the stomachs of 68 birds taken in cotton fields showed that half of them had eaten 120 boll weevils. Mr. A. H. Howell says that Pipits pick up weevils throughout the winter, and in the spring they follow the plowman and capture both weevils and grubs.[3] During an outbreak of grain aphids, these destructive insects constituted more than 70 per cent of the food of a Pipit. Mr. McAtee estimated that a flock of these birds then present must have destroyed at least a million of these pests daily.[4]

Economic Status. This is a harmless species and remarkably beneficial, especially in the southern states where it spends the winter.

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[1] Gabrielson, Ira A.: Food Habits of some Winter Bird Visitants, United States Department of Agriculture, Bulletin No. 1249, pp. 27–32.

[2] Department of the Interior, United States Geological Survey, First Report of the United States Entomological Commission for the year 1877, 1878, Appendix II, p. [19].

[3] Birds of Alabama, 1924, p. 326.

[4] McAtee, W. L.: Relation of Birds to Grain Aphids, United States Department of Agriculture, Year Book for 1912 (1913), pp. 401 and 404.

Family **MIMIDÆ.** Thrashers, Mockingbirds, etc.

Number of species in North America 11; in Massachusetts 3.

The birds of this group are thrush-like, but are separable from the thrushes by the first primary which, though short, is not spurious as in the thrushes. They show a close affinity in structure to the wrens, but they are larger and have tails relatively much longer. The bill is usually (but not always) longer or more curved than in the thrushes; the wings are short and rounded, and the tail is long and rounded or graduated. They are somewhat like wrens in habits and are all melodious singers, some with great imitative powers. The Mockingbird ranks among the most remarkable and versatile song birds of the world. These birds are peculiarly American. There are more than 40 species, most of which are confined to Central America and South America.

Mímus polyglóttos polyglottos (Linnæus). **Mockingbird.**

Other names: mock-bird; mocker.

Plate 88.

Description. — Form slender; bill moderate, rather wide at base, ridge somewhat curved; bristles about mouth well developed; wings rather short, rounded, first primary short but not spurious; tail long, slender, graduated; tarsi scaled in front, toes rather long and slender. *Adult male:* Above brownish-gray; wings and tail dark slaty to blackish, edged with pale gray, grayish or whitish; tips of middle and greater wing-coverts white, forming two wing-bars; large white patch on primary-coverts and base of primaries conspicuous in flight; three outer tail-feathers on each side largely white; below pale grayish, becoming pale smoke-gray on throat and sides, and washed with brownish posteriorly; wing linings whitish marked with blackish feather-centers; bill black, often paler at base below; iris light yellow or light grayish-yellow; feet black. *Adult female:* Similar to adult male, but white areas in wing and tail somewhat smaller. *Young in first winter plumage:* As adults or virtually indistinguishable from them, but colors not always so deep and clear, more worn and brown. *Young in juvenal plumage:* Somewhat browner above than adults, more or less mottled with darker brown feather-tips; spotted below with olive-brown; wings and tail much as in adults, but edgings browner and white more restricted; "bill and feet dusky-pinkish-buff, becoming black" (J. Dwight).

Measurements. — Length 9.00 to 11.00 in.; spread 13.00 to 15.00; folded wing 4.10 to 4.90; tail 4.50 to 5.75; bill .60 to .81; tarsus 1.00 to 1.65. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (September, October) involving body plumage and wing-coverts; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (September); adults have this one molt only.

Field Marks. — Size, near that of Robin or even longer, but more slender, tail longer; brownish-gray above, whitish or grayish below, with a large patch of white in lower wing, conspicuous in flight, and long, slender, rounded tail with much white in outer feathers; has little resemblance to any other New England birds except the shrikes, may be distinguished from them by lack of the *broad* striking *dark* stripe through eye which both shrikes show.

Voice. — Call notes, a loud *smack* and a harsh, grating *chair* (R. Hoffmann); a *chuck* or *chick* and a scolding note (almost Veery-like) *whee-e-e* (J. A. Farley); song, a sweet, thrasher-like medley, interspersed with many imitations of notes, calls and songs of other birds; may introduce the notes of thirty or more

Photograph by Dr. Arthur A. Allen

FIG. 84. — MOCKINGBIRD ON NEST

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Photograph by Daniel D. McDavid

FIG. 85. — NEST AND EGGS OF CATBIRD

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birds within ten minutes; also a rapturous indescribable flight-song by day or night, much given on moonlit nights.

Breeding. — Usually about the habitations of man, but sometimes in openings in the woods or on edges of woods. *Nest:* In shrub, tree or vine, often in dense thicket, more rarely in fence corners, in brush-heap, or in hollow top of post or stump or decayed tree trunk; among fruit trees, the apple and orange are not infrequently chosen; from 1 to 50 feet from ground; on branch, in fork or among twigs; a bulky structure composed of twigs (sometimes thorny), leaves, moss, weeds, bark-strips, grass, rags, cotton, string, rootlets, feathers, hair, down, tree blossoms or similar material, and lined with fine rootlets, horsehair, dried grass, etc. *Eggs:* 3 to 6; .89 to 1.16 by .69 to .81 in.; from long rounded ovate to elliptical ovate; varying from pale greenish or buffy-gray to bluish-green or greenish-blue, dark green or bright blue; covered with reddish-brown spots and blotches, often wreathed more or less about large end, but sometimes covered with small reddish-brown or yellowish-brown spots, and sometimes chocolate-brown, very dark brown and purplish markings appear; figured by E. A. Capen in "Oölogy of New England," Plate 1, Figs. 8–10. *Dates:* April 9 to July 12, Texas; April 1 to August, southern states; June 3 to August 19, Massachusetts. *Incubation:* Period, 14 days (Wilson), 10 days (F. L. Burns); by female. Two broods yearly, occasionally three.

Range. — Southeastern Canada and United States east of the Great Plains. Permanent resident, breeding over most of its range, chiefly in Austral zones, from eastern Nebraska, northern Iowa, southern Wisconsin, northern Indiana, Ohio, Maryland, and sparingly from New York and Massachusetts south to southeastern Texas, southern Alabama, southern Florida and the Bahamas; casual in South Dakota, southern Minnesota, Michigan, Ontario, Vermont, New Hampshire, Maine and Nova Scotia; accidental in southeastern Quebec; introduced into Bermuda Islands.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Rare resident in southern parts (chiefly), but no record of breeding in New Hampshire.* *Massachusetts, Rhode Island and Connecticut:* Less rare resident, especially in recent years.

Season in Massachusetts. — Resident the entire year, but most commonly observed in coastal regions from November to April.

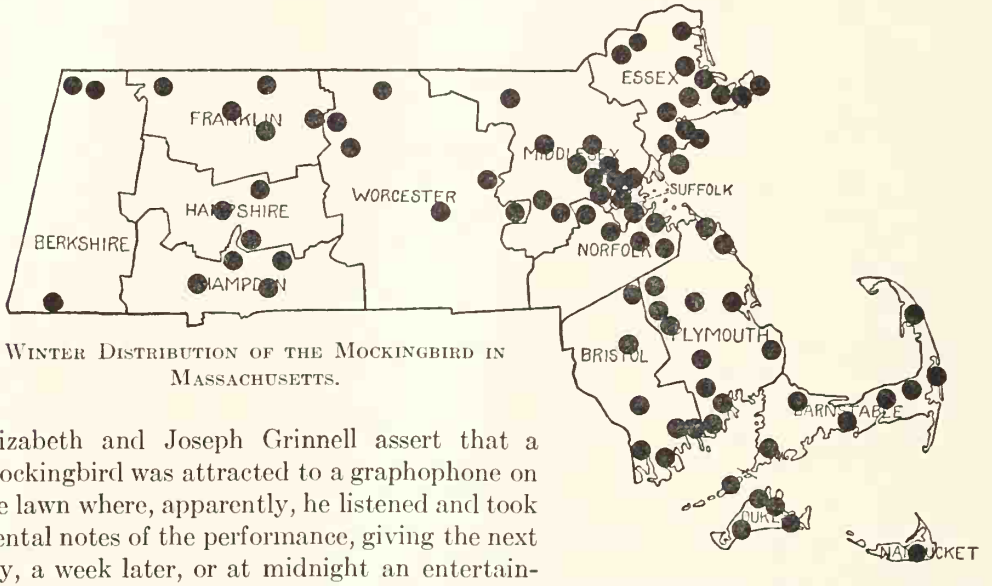
Haunts and Habits. There seems to be some evidence that in recent years the Mockingbird, which formerly was regarded as a typical southern bird, has increased in numbers to the northeast along the coastal plain until it has reached Nova Scotia and has been reported even from Newfoundland. But as it normally winters near its summer home, the severe winters of New England are likely to hold it in check, and prevent it from becoming common here. Several instances of Mockingbirds overcome by cold during severe winters have come to my attention. Before the cold winter of 1919–20 Mockingbirds were seen in greater numbers than since that time, and we had reports of six, seven and eight birds respectively, seen together. Even now (1928) we usually hear of from ten to fifteen birds of this species each year wintering along the New England coast, and most of them seem to come safely through the winter. Breeding records are rare, but regularly reported.**

I have written elsewhere as follows regarding the Mockingbird as a songster: "The Mockingbird stands unrivaled. He is the king of song. This is a trite saying, but how

* A young bird of the year was taken at Hampton, August 24, 1890, which showed no indication of having been caged, and probably was reared in the state, according to Mr. Ned Dearborn in his "Birds of Durham and Vicinity," 1903, p. 94.

** Those who are interested in the distribution of the Mockingbird in New England should read a paper by Mr. H. W. Wright (Auk, Vol. XXXVIII, 1921, pp. 382–432), who obtained a large part of his information from my records.

much it really means can be known only to those who have heard this most gifted singer uncaged and at his best in the lowlands of the Southern States. He equals and even excels the whole feathered choir. He improves upon most of the notes that he reproduces, adding also to his varied repertoire the crowing of chanticleer, the cackling of the hen, the barking of the house dog, the squeaking of the unoiled wheelbarrow, the postman's whistle, the plaints of young chickens and turkeys and those of young wild birds, not neglecting to mimic his own offspring. He even imitates man's musical inventions.



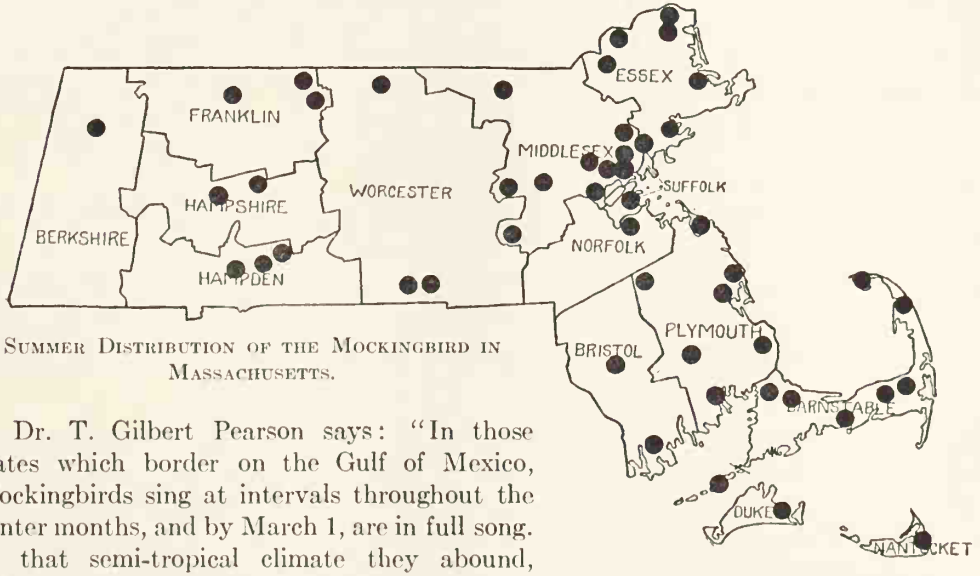
WINTER DISTRIBUTION OF THE MOCKINGBIRD IN MASSACHUSETTS.

Elizabeth and Joseph Grinnell assert that a Mockingbird was attracted to a graphophone on the lawn where, apparently, he listened and took mental notes of the performance, giving the next day, a week later, or at midnight an entertainment of his own and then repeating it with the exact graphophone ring. Even the notes of the piano have been reproduced in some cases and the bird's vocalization simulates the lightning changes of the kaleidoscope.

"The Mocker is more or less a buffoon, but those who look upon him only as an imitator or clown have much to learn of his wonderful originality. His own song is heard at its best at the height of the love season, when the singer flutters into the air from some tall tree-top and improvises his music, pouring out all the power and energy of his being in such an ecstasy of song that, exhausting his strength in the supreme effort, he slowly floats on quivering, beating pinions down through the bloom-covered branches until, his fervor spent, he sinks to the ground below. His expanded wings and tail flashing with white in the sunlight and the buoyancy of his action appeal to the eye as his music captivates the ear. On moonlit nights at this season the inspired singer launches himself far into the air, filling the silvery spaces of the night with the exquisite swells and trills, liquid and sweet, of his unparalleled melody. The song rises and falls, as the powers of the singer wax and wane, and so he serenades his mate throughout the live-long night.

One such singer wins others to emulation and, as the chorus grows, little birds of the field and orchard wake just enough to join briefly in the swelling tide of avian melody." [1]

The late Henry Oldys once told me that he had never heard more than a few notes from a Mockingbird that were not imitations. Possibly he never heard the night song of a gifted performer in southern Florida. Such birds during their daylight efforts easily surpass the best of their models, but at night they also seem to improvise, giving forth notes that so far as I know are not attempted by any other bird.



SUMMER DISTRIBUTION OF THE MOCKINGBIRD IN MASSACHUSETTS.

Dr. T. Gilbert Pearson says: "In those states which border on the Gulf of Mexico, Mockingbirds sing at intervals throughout the winter months, and by March 1, are in full song. In that semi-tropical climate they abound, and in many sections are the most abundant species. I have sometimes thought that they must be conscious of the power of their numbers, from the bold defiant manner in which the music will often come from a dozen or more throats within hearing at one time, drowning in its volume the notes of all other denizens of the fields and shrubbery. The bird revels in the glory of his vocal strength, and shouts his ringing challenge to the trees, the flowers, the very sky itself. Watch the Mockingbird some spring morning, as with ruffled feathers and drooping wings he sits on the topmost bough of a neighboring tree and pours out the beautiful story of his love. At times, the very intensity of the music within his breast seems to lift him many feet in the air. With dangling legs and carelessly flopping wings, he drops again to his perch, singing the while. Anon he descends to the earth for a moment, a few rapid hops in the grass, and he bounds again into the air with scarcely an intermission in his song. Music high and low, loud and soft, hilarious and sad, with never a hesitation, never a false note, is what falls upon your ears as you hearken to this wonderful, masterful fellow, the music-prince of the southern

[1] Nature Lovers Library, Birds of America, T. G. Pearson, Editor, Vol. III, 1917, pp. 176, 177.

highways and groves. However, it is at night that the Mockingbird is at his best. If he is the music-prince of the grove by day, he is the song-king of the lawn on moonlight nights, when at times his singing may be heard until dawn." [1]

Perhaps there is no song bird, however, that the Mockingbird cannot imitate to perfection. Mr. W. L. Dawson says he heard one change his tune 87 times in seven minutes and that he was able to recognize 58 of the imitations thus given. The Mocker is not confined, however, by the limits of bird song. His wonderful range includes such divergent tones as the scream of the eagle, the clack of the guinea hen, the caw of the crow, the crowing of the cock and the plaintive cooing of the Mourning Dove. He is said to sing every month in the year but in August, when molting, he is usually silent, though I have heard many singing well in South Carolina in September. In Massachusetts he sings some even in January and February, our most inclement winter months. Mr. C. L. Whittle gives a list of 39 bird songs, 50 bird calls, and the notes of a frog and a cricket, all imitated by one Mockingbird in the Arnold Arboretum, at Boston.[2]

The Mockingbird migrates very little. In New England most individuals pass the winter near the coast, arriving there in November and remaining until April. A few, however, pass the winter in the interior, and it may well be that those which winter at the shore come from the northward. It is probable also that some of the Mockers seen here in summer come from the south, as one of them was heard to imitate the notes of the Chuck-will's-widow, a bird that is purely accidental in New England and rarely seen north of Virginia.

Apparently the majority of New England Mockingbirds are males. As spring comes on the few females usually seem to have little difficulty in finding mates, but at least one case is recorded where a lone female built a nest, and deposited and incubated her eggs, all of course to no purpose, for the eggs were infertile.

The courtship performances of the Mockingbird are unique. As spring approaches the male often pauses for a moment in his song and stretches his wings high above his head, like a great butterfly, thus exposing in a flash his large, white wing-markings; this may be repeated two or three times. The courting or mating antics include a nuptial dance during which a pair face one another, with heads held high and tails cocked up, then *chassez* solemnly and silently from side to side, or circle one about the other. Mrs. Alice B. Harrington describes as follows the nuptial dance as she saw it at Dallas, Texas: "We saw the dance of the Mockingbirds on two different days in June. . . . It was a curious and most interesting performance. The first time they danced exactly opposite each other. They faced each other about a foot apart, hopped up and down, moving gradually to one side, then back again, and so on. A second pair began their dance in the same position, but first one hopped twice to one side, then the other followed the first, which hopped again sideways and the other followed, always facing each other, then they moved back in the same manner to where they started and repeated the performance.

[1] National Association of Audubon Societies, Educational Leaflet No. 41, 1909.
[2] Auk, Vol. XXXIX, 1922, pp. 501–506.

After each dance was finished the birds flew off a short distance in opposite directions." [1]

The nest building is largely the task of the female, but the male often assists by bringing material, and in some cases at least seems to select the site and start the nest building. The young usually remain in the nest about ten days, but even then they cannot fly well, and are likely to come to the ground where they are quickly picked up by prowling cats, which are perhaps the Mockingbirds' worst enemy. Mr. Arthur T. Wayne tells of a case where a Mockingbird and a Brown Thrasher were supposed to have mated, both being seen to feed young in the same nest.[2]

The Mockingbird is a masterful creature. He lords it over the lesser birds, and does not hesitate to attack larger ones. In winter at feeding stations the other birds seem to fear the Mocker as they do a shrike, and most of them leave the feeding place when he comes. If the Northern Flicker remains to face the newcomer, the Mockingbird descends upon his back, knocks him off the perch and swoops at him, as the discomfited woodpecker retreats. A single Mockingbird has been seen to drive three Blue Jays away from a feeding table. There is, however, much individuality in Mockers. Some will never attempt to molest a Blue Jay at a feeding tray, and others rarely seem to peck or strike any other bird in winter, but during the breeding season while the young are in the nest, most of them are pugnacious and do not hesitate to attack any cat or hawk that appears about the premises, and they have been known even to alight on the back of a person meddling with their nest. The Kingbird, however, often is more than a match for the Mockingbird, and has been known to give one of the truculent fellows a sound drubbing.

In spring and early summer, the Mockingbird feeds largely upon insects such as ants, flies, wasps, harvestmen, bugs, caterpillars, beetles (including curculios) and grasshoppers; it has been known to eat the cotton-boll weevil and the moth of the cotton boll-worm and it takes many spiders. In late summer and autumn it feeds chiefly on wild fruit, swallowing the fruit and ejecting later the indigestible seeds. It takes rose hips and the fruit of climbing bittersweet, Juneberry, hop hornbeam, corktree, black gum, ink berry, high-bush cranberry, black alder, honeysuckle, Virginia creeper, wild grape, raspberry, Virginia juniper, blackberry, hawthorn, buckthorn, sumac, blueberry, holly, poison ivy, pokeweed, bayberry, euonymus, elderberry, mulberry, mountain ash, common barberry, Japanese barberry, wild strawberry and asparagus. Sometimes this bird attacks cultivated fruit, such as figs, peaches, apples, crabapples, grapes and strawberries. Occasionally a Mockingbird has been seen apparently eating the small seeds of goldenrod and asters. People who supply food to Mockingbirds in winter find that they will eat at that season cut or sliced apples, chopped figs, dried raspberries, currants and blueberries, chopped seeded raisins, nutmeats, suet and bread crumbs mixed, and doughnuts. The small fruits given them are mostly canned fruits dried; dead insects are eaten eagerly.

Economic Status. The insect food of the Mockingbird appears to be such as would rank it high among the beneficial birds, and in New England it appears to be harmless and

[1] Bird-Lore, Vol. XXV, 1923, p. 312.

[2] Birds of South Carolina, 1910, p. 180.

useful. In some parts of the South, however, its depredations on cultivated fruit are considerable, but most planters grow enough fruit for themselves and the birds.

Dumetélla carolinénsis (Linnæus). Catbird.

Plate 88.

Description. — Form similar to that of Mockingbird, but not so slim; tail shorter and rounded. *Adults (sexes alike or similar)*: Plumage generally slate-gray above and below; top of head and more or less of forehead black or slate-black; wings blackish-slate or nearly black with broad slate-gray feather-edges; tail black, the feathers edged slate-gray basally; under tail-coverts chiefly chestnut; many females (perhaps immature) have cap less black, back tinged sooty-brown and chestnut of under tail-coverts restricted, under wing-coverts slightly paler; "bill black; iris dark purplish-brown; legs and feet brownish-black, soles pale" (Allan Brooks). *Young in first winter plumage:* Similar to adults of their respective sexes, and when in full plumage virtually indistinguishable. *Young in juvenal plumage:* More sooty-brown above than adults, cap a little darker than back and less sharply defined than in adults; wings and tail as in adult, except tail usually with very indistinct watered barring; below brownish-gray with very indistinct darker spots; under tail-coverts pale chestnut or even lighter; "bill and feet dusky-pinkish-buff, becoming black" (J. Dwight); "bill blackish; iris sepia; gape whitish-yellow; mouth deep yellow; feet dark drab-gray, back of tarsi and soles paler" (Allan Brooks).

Measurements. — Length 8.30 to 9.35 in.; spread 11.00 to 12.00; folded wing 3.45 to 3.82; tail 3.50 to 4.25; bill .60 to .75; tarsus 1.05 to 1.15. Female smaller than male.

Molts. — Same as in Mockingbird (see page 316), but molt into first winter plumage begins in August.

Field Marks. — Size between Robin and Bluebird, a slaty-gray bird, with black cap and tail and chestnut under tail-coverts; juvenal birds tinged sooty-brown above, paler and more brownish below, without noticeable dark cap.

Voice. — Call notes, a complaining, snarling *mew* resembling that of a cat, a soft mellow *chuck*, "a grating chatter *kak kak kak*" (R. Hoffmann), or "*trat-tat-tat-tat*, uttered very quickly" (E. A. Samuels), and some notes resembling slightly a call of the Blue Jay; song, similar to that of Brown Thrasher or Mockingbird, but softer, often sweeter, though frequently marred by harsh phrases and in some cases occasionally interlarded with imitations of songs or calls of other species.

Breeding. — In lowland thickets, often in dense shrubbery, about buildings and on higher lands, seems to prefer settlements to the wilderness, but localities near water or swampy land preferred. *Nest:* In dense bushes, vines, briers, low trees, etc., usually low, from 3 to 10 feet up, concealed from without by foliage; a mass of twigs, leaves, pieces of paper, grasses, etc., rather rough, straggly and bulky outwardly, but inwardly neatly lined with strips of grapevine bark, fine dark rootlets, etc. *Eggs:* 4 to 6; .94 to 1.01 by .65 to .70 in.; usually ovate; deep glossy greenish-blue or bluish-green, unmarked; figured by E. A. Capen in "Oölogy of New England," Plate I, Fig. 11. *Dates:* May 17 to 23, July 26, Connecticut; May 22 to June 20, August 10, Massachusetts; June 6, July 28, New Hampshire; June 2 to 17, July, Maine. *Incubation:* Period 10 to 14 days; chiefly by female, sometimes by both sexes. Usually one or two broods yearly, rarely three. (See Fig. 85.)

Range. — North America (except northern part) and Central America. Breeds mainly in Transition and Austral zones from central British Columbia, central Alberta, central Saskatchewan, southern Manitoba, southeastern Ontario, southwestern Quebec, New Brunswick and Nova Scotia south to northeastern Oregon, northern Utah, northern New Mexico, southeastern Texas, central Alabama and northern Florida; resident in the Bermudas; winters from Texas, Arkansas, southeastern Missouri, southern Illinois, southeastern New York and Massachusetts south to Bahamas, Cuba, Isle of Pines, Grand Cayman, Anguilla Island (West Indies), Swan Island and St. Andrews Island (Caribbean Sea) and through

Mexico and Central America to Panama; rare or wanting in a large part of the region in the United States west of the Rockies and south of the Columbia River; accidental in Arizona, on Farallon Islands (California) and in Heligoland.

Distribution in New England. — Common summer resident, except in northern and eastern Maine, and northern New Hampshire, where rare and local; absent also from higher elevations. Casual winter resident in Massachusetts, Rhode Island and Connecticut, chiefly coastwise or in river valleys; has been reported in winter from southern Maine.*

Season in Massachusetts. — (March and April) May 1 to October 16 (winter).

Haunts and Habits. The ubiquitous Catbird usually comes to southern New England in early May and leaves in September or October. Nevertheless quite a considerable number of Catbirds spend the winter, especially in mild seasons, among the sheltered thickets of our southern coastal region. At that season they are very silent and secretive, keeping mostly in thick cover and therefore are seen but seldom. Careful search among the tangles in sheltered bushy hollows will reveal one now and then if we know where to look and occasionally one appears at a winter feeding station.

The Catbird is a busybody. He is consumed with curiosity. As Chester A. Reed says, "Catbirds seem determined to find out what you are doing, why you are doing it, and what you are going to do next." Whenever anything is going on the Catbird is always "hanging around"; he peers out from some leafy shelter to see what is happening. Let anyone but imitate the scream of a frightened or wounded bird, and all the Catbirds in the neighborhood will appear in full cry; some will almost project themselves into the very eyes of the offender, as they protest with open mouths and hanging wings. Their continual outcry soon results in an anxious assembly of all the small birds in the vicinity. As I have said elsewhere, "The bird's moods are many. It is in turn a merry jester, a fine musician, a mocking sprite, and a screaming termagant, — but always an interesting study."

Let the facile pen of Dr. Elliott Coues describe the prying habits of the Catbird about the farm and garden: "Explain him as we may, the Catbird is inseparable from home and homely things; he reflects, as he is reflected in, domestic life. The associations, it is true, are of an humble sort; but they are just as strong as those which link us with the trusty Robin, the social Swallow, the delicious Bluebird, or the elegant Oriole. Let it be the humble country-home of toil, or the luxurious mansion where wealth is lavished on the garden — in either case, the Catbird claims the rights of squatter sovereignty. He flirts saucily across the well-worn path that leads to the well, and sips the water that collects in the shallow depression upon the flag-stone. Down in the tangle of the moist dell, where stands the spring-house, with its cool, crisp atmosphere, redolent of buttery savor, where the trickling water is perpetual, he loiters at ease, and from the heart of the greenbrier makes bold advances to the milkmaid who brings the brimming bowls. In the pasture beyond, he waits for the boy who comes whistling after the cows, and follows him home by the blackberry road that lies along the zigzag fence, challenging the carelessly

* Mrs. Fred H. Pitman, of Winthrop, Maine, reports a Catbird near Lake Maranacook, seen by herself and others in January and February, 1925.

thrown stone he has learned to dodge with ease. He joins the berrying parties fresh from school, soliciting a game of hide-and-seek, and laughs at the mishaps that never fail when children try the brier patch. Along the hedge row, he glides with short easy flights to gain the evergreen coppice that shades a corner of the lawn, where he pauses to watch the old gardener trimming the boxwood, or rolling the gravel walk, or making the flower bed, wondering why some people will take so much trouble when everything is nice enough already. Ever restless and inquisitive, he makes for the well-known arbor, to see what may be going on there. What he discovers is certainly none of his business; the rustic seat is occupied; the old, old play is in rehearsal; and at sight of blushing cheeks that respond to passionate words, the very roses on the trellis hang their envious heads." [1]

Few New England birds excel the Catbird in the quality or variety of its song. It is the equal of the Brown Thrasher's song, except in volume, and often excels it in sweetness; the notes resemble those of both Brown Thrasher and Mockingbird, and were it not for the cat-like mews and other harsh sounds that mar his utterances, the Catbird might rank as a songster with either of these competitors. As a mimic the Catbird falls far short of the Mockingbird, but excels the Thrasher. It is somewhat startling at times to hear the Catbird's sweetest song interrupted by a perfect imitation of some harsh cry such as that of the Great Crested Flycatcher, the squawk of a hen, the cry of a lost chicken, or the spitting of a cat. Dr. C. W. Townsend says that for a moment he was deceived by a Catbird that swooped down one July day and flew across the Ipswich River with a very perfect Kingfisher rattle and *action*. He says that he has heard this bird imitate Yellow-legs, Bob-white, Flicker, Blue Jay, Goldfinch, Barn Swallow, Wood Thrush, Veery and Robin. In addition to these notes the Catbird imitates the songs of the Brown Thrasher, Maryland Yellow-throat, Chestnut-sided Warbler, Yellow Warbler, Redstart, Yellow-breasted Chat, Red-eyed Vireo, Blue-headed Vireo, Towhee, Phœbe, Chebec, Crested Flycatcher, Acadian Flycatcher, Bobolink, Cowbird, Baltimore Oriole, Purple Finch, Goldfinch, Song Sparrow, Cardinal Grosbeak, Rose-breasted Grosbeak, Canary, House Wren, Bluebird and probably others that have not been recorded.

He is inclined to attempt to imitate the most common sounds, such as the croaking of the frogs and the utterances of barnyard fowls, but also sometimes succeeds in reproducing unusual musical sounds. Mrs. George H. McGregor, of Fall River, Massachusetts, says that while sitting on her front porch one evening a Catbird giving a loud and varied concert near-by suddenly began to sound the evening bugle call "Taps," giving the notes of the first three phrases "full, clear and round," but omitting the last notes. Soon the bird tried again, repeated the same phrases and began on the next; then changed to its customary song. This bird may have heard "Taps" in the near-by cemetery where it had been sounded often.

Some Catbirds may even attempt to imitate the screams of hawks. Miss J. Olivia Crowell tells me that she is not sure that they have a sense of humor, but that one which makes its home near her dwelling seemed to find amusement by flying from the roof of

[1] Birds of the Colorado Valley, Part First, 1878, p. 59.

the shed to that of the barn and there indulging in a series of whistles or squawks, to the utter bewilderment of four hens and a rooster, which eyed that Catbird with manifest disapproval and alarm, and cackled and craned their necks until the disturber flew away and left them in peace. He has even been known to attempt an imitation of a hand organ, keeping the time correctly, but having less success with the tune. He requires considerable practice to perfect his imitative renditions; often his first attempts are very crude.

Like the cat, the Catbird sings much at night. Never perhaps quite all night, but often most of the latter part of the night, or from about midnight until morning. At certain times his carol is almost continuous for hours. While the female is confined to the nest by the duties of incubation, the male sings as if in an ecstasy of delight, but at the least alarm he interrupts the flow of music with a cat-like *mew*. As with most song birds, so it is with the Catbird, some are indifferent songsters, while others are highly gifted. Some, at least, are able to ventriloquize, and probably all can reduce the volume of their song until it seems far away. On a fine Indian Summer day in the long ago, I listened to the song of a Catbird that seemed to come from the distant swamp, when a slight movement in the bush by which I was standing caught my eye, and there sat the little scamp singing his faraway "whisper song," about six feet from my face. The bird commonly sings in this manner on warm October days. Mrs. Helen Granger Whittle tells of a female that, while incubating on the nest, replied with a subdued whisper song to her mate that was singing near-by.[1] It is a characteristic of some Catbirds to sing in concealment, as it is of the Brown Thrasher to choose a conspicuous post in the top of some sapling. Others, apparently more bold, repair to the top of a bush or the end of a limb "as the spirit moves."

The Catbird at times seems to pour out his very soul in song! Nevertheless he also sings frequently in a matter of course, conversational, fragmentary way, and with little effort, as he goes about his daily avocations.

The Catbirds do not announce their coming—they "keep it dark"—for they migrate at night and are rather quiet upon their arrival, as they are tired, hungry and looking for food. But within a day or two, or even within a few hours, their songs are heard and they are repeated day after day until July begins to wane. In autumn I have never heard the full-voiced song, but the whisper song, audible only a few yards away, is given on warm days as long as the birds remain.

Not long after the males arrive in spring, the females appear, and then courtship begins. This is carried on largely in the seclusion of the thickets. There is much flight and pursuit, and an outpouring of song. The male with plumage raised and tail lowered bows until his bill touches the ground, and sidles about in a curious manner, or struts with lowered wings and tail erected, wheeling about and exhibiting the chestnut patch on his under tail-coverts. When finally the nuptials have been celebrated, the nest building begins. At this some males become capable assistants; others leave this task entirely

[1] Auk, Vol. XL, 1923, p. 606.

to the female, while still others assist in nest building but not in incubation or brooding. Perhaps there is as much individuality in this respect among birds as among men. In incubation also some males assist and sometimes sing on the nest, while others do not. The nest building usually requires a week or more, and the young remain in the nest nine to sixteen days.

The devoted parents are now very pugnacious and will imperil their lives in defense of their brood. An intruding Blue Jay or a Cuckoo is soon compelled to flee, and the devoted birds will even do battle with nest-robbing snakes and some of them do not hesitate to attack a human disturber of the nest. Mrs. George H. McGregor tells how a Catbird attacked a Blue Jay at her feeding table in May, 1925. The Catbird bristled up to "nearly twice its natural size" and descended upon that unfortunate Jay's back, frightening the larger bird so that it actually squealed. Later the valorous Catbird descended on its enemy again. This time the Blue Jay saw it coming and evaded the blow, but screamed out in terror as it flew.

When the first brood leaves the nest, a second nest is begun almost immediately, while the young of the first brood are fed largely by the male. When both broods are safely out of the nest, all usually retire to thickets where berries grow, and remain in such retreats during the molting season. Rarely a third brood may be raised. Three broods have been reported in one dooryard and parent Catbirds have been seen feeding young recently from the nest in September. Catbirds are fond of bathing in summer and will bathe even in showery weather, but they dislike extremely cold water. After the early frosts come they are likely to seek moist runs sheltered by pines or other dense trees, and soon the southward movement begins.

Unfortunately the Catbird seems to have acquired a bad reputation. The country boy pursues it with stones and imprecations, and even some of its neighbors among the birds manifest animosity. Its cat-like cries, its thieveries in the fruit garden and its occasional interference with the domestic affairs of other birds, tend to strengthen the prejudice against it, which is largely unwarranted. Many people who are familiar with its cat-like mew are unaware that it can sing. John Burroughs says that he shot one in the act of destroying the eggs of a Least Flycatcher, and the late J. Chauncey Lyford told me that he saw a Catbird similarly engaged. Probably such actions are exceptional and individual, and the bird really deserves a better reputation.

The Catbird has earned a place as the characteristic bird of the country home. Around him cluster memories of childhood's days. Dr. Witmer Stone, recognizing the claim of the bird on our bounty, says: "Let us bear in mind the needs of the Catbird when we care for our grounds, and leave him a corner in which he may find a shady thicket sufficiently dense to be congenial. It would be to me a poor garden indeed that did not have some retreat from which I could hear that harsh complaining cry of the Catbird, when I chanced to stroll by. Every bird note brings back to us some association, some memory of the past, and with the cry of the Catbird there comes before my mind's eye the old garden with which, as a boy, I was so familiar. I see the thicket of lilacs and mock-

oranges, and the gooseberry bushes bordering the path, the spreading boughs of the apple trees with the sunlight filtering through; the smell of ripening fruit is in the air, and the stillness of a quiet summer afternoon is broken only by the hum of insects and the complaining voice of the Catbird from his shady retreat." [1]

The Catbird's food in spring consists almost entirely of both land and water insects. As wild fruits begin to ripen it turns largely to these or to the small fruits of the garden, and wintering Catbirds subsist almost entirely on persistent wild fruits, which are retained on the stem throughout the inclement season. The stomachs of 645 Catbirds examined by the experts of the Biological Survey contained 44 per cent of animal food and 56 per cent of vegetal food. Three-fourths of the animal food consisted of ants, beetles, caterpillars and grasshoppers. The remainder included bugs, miscellaneous insects and spiders. One-third of the vegetal food was made up of cultivated fruits or fruit that may be cultivated, such as strawberries, raspberries and blackberries.[2] In New England a large part of this component consists of wild berries. The rest of the vegetal food is mostly wild fruit, as wild mulberry, wild cherries, berries of flowering dogwood, honeysuckle, sour gum, buckthorn, elder, spicebush, black alder, smilax, holly, Juneberry, sassafras, Virginia creeper, poison ivy, frost grape, common barberry, Japanese barberry and pokeberry. Mr. J. A. Heath informs me that he saw a Catbird carrying pieces of a mushroom to its young. When he examined the mushroom he found that the bird had taken two-thirds of it. This bird occasionally eats small earthworms, and small fishes or fish fry. Occasionally also Catbirds living near dwellings learn to eat crumbs and garbage. At feeding stations they have learned to take boiled potato, cold mush, fried fish, beef stew, chopped peanuts, moist bread, bits of beef scraps, suet, raisins, apples cut in halves and hemp seed.

Economic Status. In the New England states where there is much wild fruit the Catbird does little harm to cultivated fruit, though a few birds may do more harm than good in the strawberry beds, and some individuals, by reason of their habit of catching tiny fishes, are destructive in fish hatcheries. In the prairie regions where little wild fruit grows, the Catbird sometimes does considerable damage to crops of small fruits. Professor F. E. L. Beal says "it cannot on the whole be considered injurious. On the contrary in most parts of the country it does far more good than harm." [3] Mr. Ira N. Gabrielson reports the food of nestling Catbirds as consisting of 96 per cent insects, mostly injurious, and 4 per cent fruit.[4] As Catbirds raise two broods yearly over most of their range, the food of the young is important. The Catbird destroys numbers of such first class pests as May beetles, potato beetles, cucumber beetles, click beetles, locusts, crickets, cut-worms and cut-worm moths, canker-worms, hairy caterpillars, including those of the gipsy moth, of which it is an important enemy, and the spiny cater-

[1] National Association of Audubon Societies, Educational Leaflet No. 70, 1913.
[2] Beal, F. E. L.: United States Department of Agriculture, Farmers' Bulletin No. 630, 1915, p. 8.
[3] United States Department of Agriculture, Farmers' Bulletin, No. 630, 1915, p. 8.
[4] Wilson Bulletin, Vol. XXV, 1913, pp. 175, 176.

pillars of *Euvanessa antiopa*, the mourning cloak butterfly, which most birds seem to avoid; weevils, borers, flea-beetles, grapevine beetles, plant-lice, leaf-hoppers, saw-flies and chinch-bugs. Mr. W. L. McAtee says that from the forester's standpoint alone "the Catbird is a beneficial, and no doubt at times, a very helpful species." [1]

Toxóstoma rúfum (Linnæus). Brown Thrasher.

Other names: BROWN THRUSH; RED MAVIS; PLANTING BIRD.

Plate 88.

Description. — A thrush-like bird, but bill rather long and slightly curved, bristles about mouth well developed; wings short and rounded, and tail long, rounded, much longer than wings. *Adults (sexes alike)*: Above reddish-brown or cinnamon-rufous; tips of primaries paler; inner webs of flight-feathers dusky; two white wing-bars (buffy in autumn), each preceded by a narrow dusky bar or a row of dusky spots; outer tail-feathers usually slightly and indistinctly tipped with buff or very pale buff; sides of head a streaked mixture of rusty and pale buffy or buffy-whitish; below including wing linings pale buff to whitish, lightening on chin, throat and abdomen (usually deeper buff below in autumn); throat bordered by brown streaks, and breast, sides and flanks streaked with long chains of spots of dark brown; "bill blackish, buffy at base below; iris deep yellow; legs and feet drab" (Allan Brooks); "bill black, but pale yellow or whitish at base below; iris bright yellow; legs and feet grayish-brown, brightening to reddish-brown on front of tarsi" (N. S. Goss). *Young in first winter plumage:* Virtually indistinguishable from adults in autumn and winter. *Young in juvenal plumage:* Above much as adults in ground color; top of head darker, rump lighter, but mottled or streaked with darker brown; tail with "watered" barring; wing-bars buffy, tertials edged and tipped buffy, and spots or streaks below more numerous.

Measurements. — Length 10.30 to 12.00 in.; spread 12.50 to 14.60; folded wing 3.75 to 4.60; tail 4.40 to 5.75; bill .90 to 1.10; tarsus 1.10 to 1.40. Female smaller than male.

Molts. — Similar to those of Mockingbird (see page 316).

Field Marks. — Size of Robin or larger but more slender, with longer tail. A rusty-red or tawny-reddish-brown thrush-like bird, with breast darkly streaked, but bill longer and more curved and tail much longer than in our true thrushes and much rounded; two white or pale wing-bars.

Voice. — Calls, a loud *smack*, a plaintive whistle *ti-yoo-oo* or *wheurrr*, and a sharp *click*, also a hissing or wheezing sound; song, a succession of phrases of two to four syllables, loud, clear, rich, musical and of great variety, each one delivered as a positive statement complete in itself, and unrelated to the rest, with a brief pause after it — all bearing considerable resemblance to the songs of the Mockingbird or Catbird, but mostly original with occasionally an imitation of some other bird's notes.

Breeding. — Usually in sproutland, or in bushy thickets, or bush pastures. *Nest:* On ground, in a pile of brush, in bush, vine, or low tree, often in a thorn tree or in a fence corner, never very far from the ground; bulky, composed of twigs, sticks, leaves, strips of bark, weed stalks and rootlets, which last usually are used for lining. *Eggs:* 3 to 6; .99 to 1.12 by .74 to .89 in.; nearly oval; white or greenish-white to pale green, profusely dotted with reddish-brown; figured by E. A. Capen in "Oölogy of New England," Plate I, Figs. 12, 13. *Dates:* April 20 to May 15, Virginia; May 15, eastern Pennsylvania; May 19 to June 4, Rhode Island; May 9 to June 21, Massachusetts. *Incubation:* Period about 13 days (C. E. Heil); by both sexes. One or two broods yearly, possibly sometimes three in the south.

Range. — Southern Canada and the United States, chiefly east of the Rockies. Breeds mainly in Transition and Austral zones from southern Alberta, south-central Saskatchewan, southern Manitoba, northern Wisconsin, northern Michigan, southeastern Ontario, southwestern Quebec and southern Maine

[1] Roosevelt Wild Life Bulletin, Vol. 4, No. 1, 1926, p. 81.

south to southwestern Colorado, northern Texas, southern Louisiana, Mississippi, southern Alabama and central Florida and west to central Montana, central Wyoming and southwestern Colorado; winters from southeastern Missouri, North Carolina and (casually) Massachusetts to southern Texas, southern Louisiana, southern Alabama and southern Florida; accidental in Arizona and Heligoland.

Distribution in New England. — *Maine:* Common summer resident locally in southwestern counties and east to the Kennebec valley; rare or absent elsewhere. *New Hampshire:* Fairly common to uncommon summer resident, north to White Mountain valleys. *Vermont:* Uncommon or occasional summer resident, chiefly in valleys. *Massachusetts, Rhode Island and Connecticut:* Common summer resident; casual winter resident.

Season in Massachusetts. — (April 10, 16) April 20 to October 26 (winter).

Haunts and Habits. As April wanes the Thrasher comes. Silent at first, and furtive, he reconnoiters the land. We may hear him scratching among the fallen leaves of yester-year, but if approached he retires into the thickets, there to lurk and perhaps to mope silently for a few days if the face of the sun be hidden. He prefers dry thickets to the swampy ones so often sought by the Catbird. Bushy pastures, sproutland, brier patches and tangles are his favorite haunts. He is more shy and retiring than the Catbird, but nevertheless may be found occasionally about farmyards, or even lawn shrubbery. In late April or early May in sunny hours, especially when the south wind blows, the Thrasher mounts some sapling and pours forth his song. For the time he seems to have lost his shyness, for he sits aloft for all to see and his song is loud, clear, eloquent and sweet. It must attract attention to the singer, for under favorable circumstances it may be heard for half a mile. Nevertheless let some one approach him too closely and he dives down into the cover of his favorite thickets and steals away to hide from curious eyes. This shyness is characteristic of the bird. Unlike the Catbird or the Mockingbird that frequently build their nests about the habitations of mankind, the Thrasher prefers to retire to bushy pastures or thickets, and only an occasional pair becomes bold enough to nest in the shrubbery about the lawn or garden.

He pays little attention, however, to the plowman or the busy farmer, for at planting time he sits near-by on some tree-top and sings — at least so the country people say — "drop it, drop it, cover it, cover it, I'll pull it up, I'll pull it up," and so some of the country people call the singer the "Planting Bird." The song is so bold and emphatic, its phrases so abrupt, that it annoys some people, while others believe that it has few rivals among bird songs. Ned Dearborn did not like to hear it. Arthur T. Wayne says: "To my ear the song of the Brown Thrasher is sweeter, richer and wilder than the Mockingbird, and as a musician he is simply incomparable." Simeon Pease Cheney thus describes his actions: "On a fine morning in June, when he rises to the branch of a wayside tree, or to the top of a bush at the edge of the pasture, the first eccentric accent compels us to admit that the spirit of song has fast hold on him. As the fervor increases, his long and elegant tail droops, his whole plumage is loosened and trembling, his head is raised, and his bill is wide open; there is no mistake, it is the power of the god. No pen can report him now; we must wait till the frenzy passes." [1] William L. Dawson

[1] Auk, Vol. VIII, 1891, p. 33.

says: "Now and then he lapses into mimicry, but for the most part his notes are his own — piquant, incisive, peremptory, stirring. There is in them the gladness of the open air, the jubilant boasting of a soul untamed." [1]

Curiously enough there is disagreement among authors regarding the imitative powers of the Thrasher. Wilson, Nuttall, Brewer, Samuels, Nehrling, Minot and Simmons seem to believe that it never imitates the notes of other birds; while Maynard, Knight, Dawson, Judd, E. A. Brooks, and Bradford Torrey all give the bird credit for successful imitations. I am inclined to agree with the latter gentlemen, as I do not believe that the clear call of the Whip-poor-will which I have heard some Brown Thrashers give and repeat is a natural Thrasher song, nor can I believe that the notes of the Bobolink which are sometimes attempted by the Thrasher are an integral part of his own native song. E. A. Samuels says of the song: "It is a confused mixture of the song of different birds, or rather seems to be, but is really its own song." Mr. Henry Oldys wrote to me that he had heard from the Brown Thrasher phrases in which he detected enough resemblance to the utterances of other birds to set them down as imitations. The songs thus imitated were those of the Carolina Wren and the Cardinal Grosbeak, and some notes of the Blue Jay. But he said that he had heard even closer imitations of some American birds by European birds in their native countries. Thus one is led to wonder where likeness or coincidence end and imitation begins. However, Mrs. Jean E. Carth writes that she has heard the Brown Thrasher imitate the Kingfisher, Robin, Scarlet Tanager (call note), Goldfinch, Baltimore Oriole and a frog. Miss J. Olivia Crowell writes that she heard one that varied its usual notes to something very much more like the song of the Catbird, interspersing the performance with many of the harsher notes of the latter which apparently are not normal to the Brown Thrasher. Mr. B. K. Lewis writes that in Florida he has heard from the Brown Thrasher notes of the Cardinal Grosbeak and the Great Crested Flycatcher. I believe that all true song birds are imitators, some imitate only their own kind, others imitate other species more or less. If an English Sparrow confined from birth with Canaries can imitate their trills, why cannot as accomplished a musician as the Brown Thrasher imitate other birds if he chooses to do so; but most of his notes seem to be his own, and perhaps many individuals never imitate other birds. The imitator may be the exception.

In early spring the song of the male is delivered from an elevated position, apparently to attract the female. When the females arrive courtship proceeds mostly on or near the ground, under cover of the sheltering foliage, and so it is rarely observed. During the building of the nest, which requires from six to ten days, and in which both birds take part, the song of the male is heard more from cover. Thus during love making and nest building, the male is not very conspicuous. But when the nest is completed he again sings occasionally from the tree-tops, though he usually takes some part in incubation, until the young are hatched, after which he takes his full share of their care and protection. I believe that after nesting really begins he seldom sings near the nest site, but

[1] Birds of Ohio, Vol. I, 1903, pp. 257, 258.

Professor O. W. Knight says that he sometimes sings from the nest while engaged in incubation. Probably habits vary with different individuals. In Massachusetts the song period usually lasts until the first week of July, and some singing is heard occasionally later in the month. There is very little fall singing, though Mr. Gabriel Cannon says that on September 6 and 7, 1920, he heard one giving a whisper song at Spartansburg, South Carolina.

Both male and female sit very closely; in some cases a hand has been placed on the back of the sitting bird, and both parents, though usually shy, defend their young with great bravery. They have been known repeatedly to strike and beat a hand inserted in the nest. Under the heading "A Thrashing by Thrashers," Mr. Herbert K. Job describes how he was attacked by a pair of these birds when he came near their nest. He says: "I thought I would see what they would do if I actually handled the young. So I started to lay hold of the chick in the nest. But no sooner had I touched him than like a whirl-wind, with shrieks of rage and despair, both Thrashers precipitated themselves upon me. Seizing my fingers in their claws, they hung on, scratching like badgers, nipping my hand here and there with their sharp bills, and beating it furiously with their wings. Then they darted off into the thicket, and again and again I touched the young one, with the same result. The whole performance so interested me that I felt no injury from their attack. When I bethought myself to look at my hand, I saw that it was dotted with little drops of blood, where they had scratched or bitten through the skin. Then I wrapped a handkerchief around as armor and let them try their strength on that. If I put my foot near the nest, they went for that in the same vindictive fashion." [1]

Here is one reason for naming the bird Thrasher, though such bold attacks on a human being are rare. One writer affirms that the name of the bird was suggested by the way it thrashes its long tail about. Another asserts that the way in which it thrashes and bangs with its beak the insects and seeds on which it feeds is responsible for its name. In this respect its habits much resemble those of the Blue Jay, except that it commonly beats its prey on the ground, while the Blue Jay uses a limb. The Brown Thrasher uses its bill a great deal in tossing aside the dead leaves and other débris on the ground to get at insects or earthworms beneath. It digs up the ground with its bill while searching for worms and grubs, and it does not attempt to crack sunflower seeds in its bill as the Purple Finch and the Cardinal Grosbeak do, but beats and pecks them to remove the hulls. Mrs. Alice B. Harrington tells of one that ate his sunflower seeds in a certain place until he had pecked a small hole in the ground, in which he placed the seed and held it down with his claws while he dissected it.

The young remain in the nest about twelve days, unless frightened out of it by some enemy, when they hide in the underbrush. Brown Thrashers pass the greater part of their time on or near the ground. They run or hop and when running in great haste partially spread and even flutter their wings to help themselves along. Their flights usually are short, low and not very rapid. They frequently come out to dust in dirt

[1] Bird-Lore, Vol. IX, 1907, pp. 241–244.

roads and they are fond of bathing. In August when the young of the second brood have been reared they all go into retirement during the molt and gradually slip away toward the south. They are said to migrate by stealing from thicket to thicket, and this may be true as their migrations are very slow. A few are left behind to winter in New England, and although the numbers of those wintering here are less than those of either the Catbird or the Mockingbird, they seem to be scattered more widely through the interior, whereas the others winter chiefly along the coast.

The constituents of the food of the Brown Thrasher vary of course with the season and during its migrations, as is the case with most of our migratory birds. In spring it subsists almost entirely on insects, spiders and worms, but in summer and autumn the greater portion of the food is fruit (chiefly of wild varieties), mast (chiefly acorns) and corn (chiefly waste grain picked up from the ground). An examination of 266 stomachs of the bird from various parts of the country was made by Professor F. E. L. Beal of the Biological Survey, and it showed that the food consisted of 37.38 per cent vegetal and 62.62 per cent animal food, the latter nearly all insects. The insect food was rather evenly divided among the various orders. Beetles were eaten regularly the year round.[1] Such pests as May beetles, white grubs, twelve-spotted cucumber beetles, many weevils, including the cotton-boll weevil, curculios, snap-beetles and wire-worms, rose-beetles, strawberry-crown girdlers and wood-boring beetles, caterpillars, including canker-worms, army-worms, cut-worms and hairy caterpillars such as the tent and gipsy caterpillars, also bugs of many kinds, especially those that eat berries, also leaf-hoppers, tree-hoppers and cicadas, quantities of grasshoppers and locusts and many crickets are eaten, also many of the ants that destroy timber. A small proportion of beneficial ground-beetles are taken, and a very few wasps and bees; daddy-long-legs, sow-bugs, small batrachians, lizards and snakes are taken more or less.

Dr. T. Gilbert Pearson watched a pair of Brown Thrashers that had a nest with young in a thorn bush. He saw that in feeding the young, one of the birds invariably hopped up from the ground and from limb to limb on one side of the bush, while the other did the same on the other side. He says: "I became curious to know just how often they brought food, and one morning, with notebook in hand, sat for an hour on the veranda watching the movements of our little brown neighbors. Through my field-glasses I could see that they brought one, and at times apparently two or three, insects or their larvæ at each trip. Every time a bird came to the nest, I made a mark with my pencil. In the middle of the day I made the same observations for an hour, and repeated the records in the evening.

"The bird which went up the right-hand side of the bush made a trip on an average of every two and a half minutes, and the bird which went up the left-hand side, made a trip every ten minutes. The young were in the nest in the neighborhood of two weeks. If the birds took only one insect a trip, it would mean that during this interval these Brown Thrashers fed to their young 5,180 soft-bodied worms and insects. This, of course, does

[1] United States Department of Agriculture, Farmers' Bulletin No. 755, 1916, pp. 12, 13.

not take into consideration what the old birds ate during this time; nor what they consumed during the period of incubation; nor all those delectable morsels which the male fed to the female during the blissful days of courtship. Suppose we include all these, and also what the family of six ate after the young had left the nest and flown into the bushes; it is a conservative estimate to say that this pair of Brown Thrashers and their young were responsible, that summer, for the destruction of the lives of fifty thousand insects, many of which were injurious to the vegetation of the region." [1]

Economic Status. As the Brown Thrasher takes much less cultivated fruit than the Catbird, as most of its other vegetal food consists of waste grain or wild products of the woods and fields, the only charge that can be brought against it is that of pulling newly planted corn, and this habit seems local and restricted to the few. Professor Beal says that all in all the Brown Thrasher must be considered a useful bird.

Family **TROGLODYTIDÆ.** Wrens.

Number of species in North America 14; in Massachusetts 5.

The wrens are rather closely related to the *Certhiidæ* or tree creepers, but may be distinguished from them at once by the rounded and moderately graduated tail, the feathers of which are not stiffened and pointed but comparatively soft and rounded. The wrens are related also to the thrashers, but are much smaller, with relatively shorter tails. Their plumage is never bright in color. Brown or reddish-brown predominates, usually varied with speckles, streaks and bars of dusky and the sexes are alike, or nearly so. The bill is usually rather long and slender, with the bristles around the mouth usually obsolete. The wings are short, rounded and concave, with *ten primaries*, the first short but not spurious. The tail is variable in length, but usually short and rounded. The inner toe is united by half its first joint or more to the middle toe. There are over 250 species in various parts of the world. Wrens are found throughout the United States, but are most numerous in tropical America. Many members of the family are fine songsters, but when alarmed their calls are harsh and insistent.

Economic Status. Wrens are prolific birds and beside feeding largely on injurious insects, feed their young almost wholly on insect life. They are considered to be very beneficial to agriculture and forestry, and the only complaint against them is that some species molest the eggs of other birds.

Thryothórus ludoviciánus ludovicianus (Latham). **Carolina Wren.**

Other names: great carolina wren; mocking-wren.

Plate 89.

Description. — Largest New England wren. Bill rather long and curved, head large, wings short, tail still shorter. *Adults in breeding plumage (sexes alike)*: Above reddish-brown, duller on forehead and

[1] National Association of Audubon Societies, Educational Leaflet No. 68, 1913.

crown, brighter or light chestnut on rump, with concealed white spots; wings and tail slightly duller brown than back and narrowly barred (sometimes indistinctly) with dusky; middle wing-coverts and usually more or less of greater wing-coverts with white or pale buffy triangular end spots, edged (except at ends) with dusky; outer edges of primaries and outer tail-feathers with pale spots; a long whitish stripe from bill over eye to nape usually bordered by dusky lines and below this a broad reddish-brown stripe runs back merging with the general ground color on neck; sides of head below eye dull white to buffy, streaked finely in part with dusky; below dull buffy or rusty-whitish, tinged deeper on upper breast and sides, flanks and about vent, lightest on chin and throat; wing linings paling near edge of wing and spotted with dusky; sides and flanks very rarely barred dusky-brown; "bill blackish above, bluish below, rami flesh-color; iris dark raw-umber; legs, feet and claws pale brownish-flesh-color" (Allan Brooks). *Adults in winter plumage:* Similar but averaging brighter above and more buffy below; stripe over eye more buffy than in spring. *Young in first winter plumage:* As spring adults or nearly so, though flight-feathers may show more wear in some cases, and in some, feathers of upper breast have indistinct dusky margins; texture of feathers always loose. *Young in juvenal plumage:* Lighter than first winter plumage, the crown darker by reason of dusky feather-tips; wing-coverts tipped buffy; more or less spotted below with small dusky markings; "bill and feet pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 5.10 to 6.00 in.; spread 6.80 to 7.80; folded wing 2.10 to 2.50; tail 1.80 to 2.35; bill .65 to .77; tarsus .65 to .78. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September) involving body plumage, wing-coverts and tail; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (August, September); adults molt but once a year (postnuptial) and breeding plumage results from wear.

Field Marks. — Size between Chipping Sparrow and Song Sparrow, but tail shorter; a reddish-brown bird, lighter below, with rather long, slightly curved bill, short tail, *a long whitish stripe over eye,* barred wings and tail, but back plain, unmarked.

Voice. — Call notes innumerable clacks, metallic rattles, musical trills and *k-r-ings* (E. H. Eaton); alarm note a rather smooth *peurr;* song, a loud and clear whistle, can be heard a quarter of a mile, very variable; "common forms *twip pity, twip pity; whiddy you, whiddy you, whiddy you, thrî-ou, thrî-ou, thrî-ou*" (Ralph Hoffmann); and many other phrases, often uttered in threes, also imitations of the songs and notes of other birds.

Breeding. — Almost anywhere where suitable nesting places may be found, in woodland or orchard, on river bank or about farm buildings, sawmills, etc. *Nest:* In a cavity in tree or stump, at the base of an old leaf-stalk on a palmetto tree, in an old tin can on a river bank or dump, a nesting box, a hole in a bank, among upturned roots of fallen tree, a box, shelf or basket in mill, shop, barn or outbuilding, or over a window frame or door frame; from the ground to 40 feet up; composed of leaves, bark fibers, grass, hay, shavings, pine needles, moss, snake skins or other fibrous materials and lined with Spanish moss, feathers, hair, rootlets or similar fine stuff. *Eggs:* 4 to 8; .73 to .80 by .56 to .61 in.; approaching oval; white to creamy-white or salmon-buff, with many spots of cinnamon, rufous or reddish-brown, pinkish-brown and lilac, usually more heavily spotted than eggs of other New England wrens; figured by E. A. Capen in "Oölogy of New England," Plate II, Fig. 11. *Dates:* April 15 to June 7, Georgia; April 5 to July 11, South Carolina; April 15 to June 15, Virginia; June 8 to June 20, Massachusetts; but eggs have been found apparently laid in December and January in some states. *Incubation:* Period 12 days (F. L. Burns); chiefly by female. Two or three broods yearly.

Range. — Eastern United States (west to the Great Plains) and southeastern Ontario. Resident and breeds in Upper and Lower Austral zones from central-eastern Nebraska, northern Iowa, southern Wisconsin, central Michigan, southeastern Ontario, central New York, Massachusetts and southern Maine (occasionally) south to south-central Texas, southern Louisiana, southern Alabama, northern Florida and west to Kansas and west-central Oklahoma.

PLATE 89

PLATE 89

HOUSE WREN
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WINTER WREN
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CAROLINA WREN
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LONG-BILLED MARSH WREN
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SHORT-BILLED MARSH WREN
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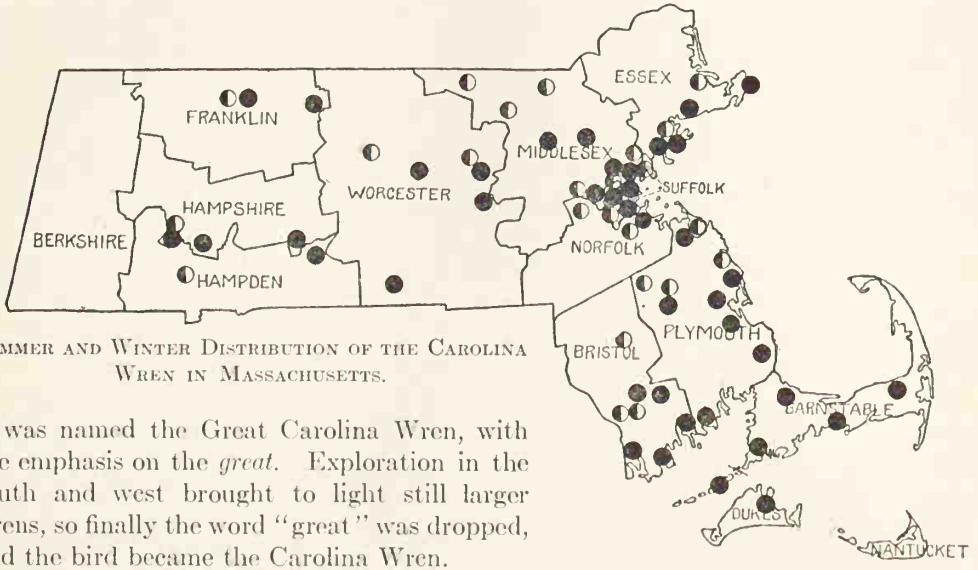
Allan Brooks

Distribution in New England. — *Maine and New Hampshire:* Accidental visitor. *Vermont:* Doubtfully recorded. *Massachusetts, Rhode Island and Connecticut:* Rare resident.

Season in Massachusetts. — Resident throughout the year.

Haunts and Habits. From time immemorial the word "wren" has been used in the Old World to denote one of the smallest of birds. The settlers of New England, finding a similar little feathered friend in this country recognized and named the bird described by Darius Green as "the little, chatterin' sassy wren." Larger wrens were discovered later and one was so much larger than the other members of the family then known that



Summer and Winter Distribution of the Carolina Wren in Massachusetts.

it was named the Great Carolina Wren, with the emphasis on the *great*. Exploration in the south and west brought to light still larger wrens, so finally the word "great" was dropped, and the bird became the Carolina Wren.

Though much larger than other New England wrens our subject is a typical or even a superlative member of the wren family, full of nervous energy, remarkably quick and active, almost always in motion, consumed by curiosity, an adept at concealment, and shy or confiding according to circumstances and individual caprice. Its flight is short and rather ragged, but its little wings seem to vibrate almost as rapidly as those of a hummingbird. Normally it is a bird of primeval forests; low moist woodlands and alder swamps are suited to its tastes, and it nests largely along the branches of streams in holes in the ground, among the upturned roots of fallen trees, or in lowly cavities of trunk or limb.

With the coming of settlements, and the introduction of roaming cats, dogs and hogs, many wrens sought safer nesting places higher up in the trees and in the outbuildings of the settlers. Naturally devoted to brush heaps, tangles, thickets, fallen timber and the dells of deep woods, where it can hide away at the least alarm, such a complete change of location as the environment of farm buildings, with a nest in some barn or other out-

building, must have been made with many misgivings, many advances to reconnoiter, and many quick retreats to the shrubbery or the woodpile, where the little creature can vanish like a mouse, but its curiosity must be satisfied. The wren, energetic, tireless, with tail on end, must explore every nook and cranny of the outbuildings and observe surreptitiously or otherwise the strange creatures that inhabit them.

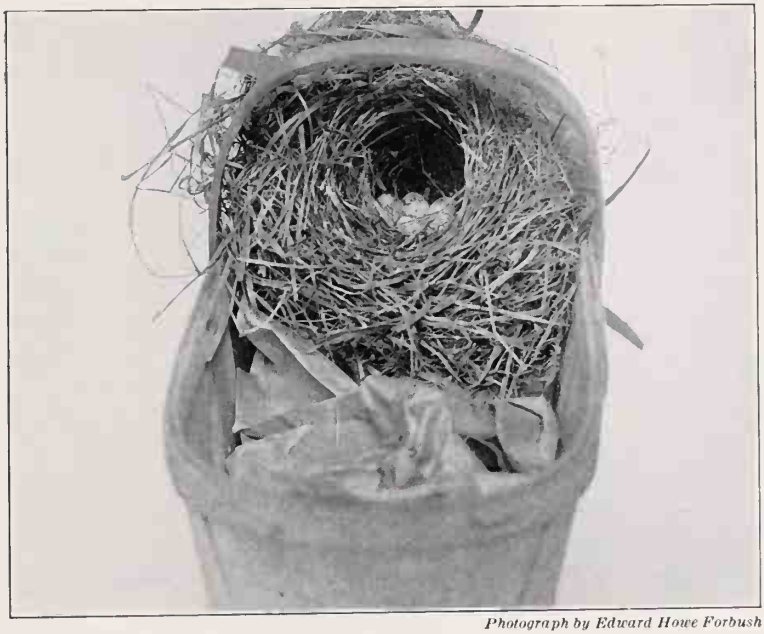
Mr. W. L. Dawson writes thus of the creature's curiosity in Ohio: "When the bird man settles down into a shady nook and begins screeping, that is, making a sharp kissing sound on the back of the hand, to attract the attention of the birds, the very first fellow to come is always the Carolina Wren. He had been catching spiders about the root of a fallen tree, but like the true Athenian, he will hear the new thing at whatever cost. Bustling, tittering, and talking excitedly to himself he hurries up. At the first sight of the stranger he jumps as if shot, but he has presence of mind enough to dodge behind a log and take chattering counsel of his fears. Then, more cautiously, he emerges and begins a systematic search. Now scampering along a log with tail in air like a chipmunk, now squatting in sudden alarm, and craning and bubbling apprehensively, the little feathered ferret turns up first on this side of you, then on that, until his curiosity is thoroughly satisfied." [1]

This wren is so furtive and secretive that when seen in a bush in the open field or pasture, often it will disappear on close approach of the observer by dropping to the ground and running rapidly but unseen, under cover of weeds and grass, to the shelter of some other bush or clump, rather than expose itself by flight through the air.

Although it gets most of its food on or near the ground, it sometimes climbs the trunks of trees like a creeper in its search for insects or their eggs, and it goes over rough buildings inside and out, peering into cracks, crannies and recesses for insects or spiders that may be lurking there.

The Carolina Wren is one of the few birds in North America that sings in every month of the year. The song is remarkably loud and clear, and the singing bird is very likely to come out of hiding and carol boldly from the top of bush or tree. In uttering it the bird often squats a little and jerks its body as if putting all its energy into its voice. Some of its common notes have been represented by the words *wheé udel, tea-kittle* or *twipity*, etc., according to the imagination of the listener, the words being repeated two or three times. Dr. A. W. Butler says that a boy represented two of its phrases with the words "*kick'er mother, kick'er mother.*" In the South, where the bird is common, it is supposed to sing *sweetheart sweetheart sweetheart*, sometimes adding the word *sweet*. A great number of phrases are attributed to it, for it is really a very accomplished musician, a ventriloquist also, and something of a mocker. Some of the notes resemble closely those of the Cardinal Grosbeak. It is credited with imitations of notes or songs of the Tufted Titmouse, Belted Kingfisher, Pine Warbler, Towhee, Red-winged Blackbird, Flicker, Meadowlark and Bluebird. Nuttall says that at Tallahassee, Florida, he heard a Carolina Wren "chanting near the door of a cottage," and occasionally "imitating, in

[1] Birds of Ohio, Vol. 1, 1903, pp. 259, 260.



Photograph by Edward Howe Forbush

FIG. 86. — NEST AND EGGS OF CAROLINA WREN

Page 334

Photograph by Dr. Francis Harper

FIG. 87. — LONG-BILLED MARSH WREN AT NEST

Page 350

his way, the squalling of the crying child within." On account of its apparent imitative powers, it is known locally as the Mocking Wren. Some good judges believe, however, that its notes are all its own. This wren is a persistent singer; even in Massachusetts it sings more or less in every winter month.

Apparently Carolina Wrens are exemplars of constancy. They seem to mate for life. Summer and winter they are usually seen in pairs, although occasionally unmated birds appear, especially north of their usual range. Many of these wandering stragglers have been seen in New England, too often to record here, but occasionally a pair appears and settles. On July 7, 1901, Mr. Henry S. Forbes discovered a pair with young on Naushon Island, and for many years afterward one or more pairs frequented the island, and probably bred there. I saw them there twice, but was unable to discover the nest.

I once saw a nest that had been built by the birds in a grape basket on the shelf in a shop at Fairhaven, Massachusetts. This nest was observed by the owner of the shop, and the birds deserted it, as they are prone to do if anyone even goes near their domicile before the young are out of the shell. This pair of birds then went into the adjoining barn and built another nest in another basket partially filled with sticks of dynamite, which the owner had hung up for safety in the peak of the roof, directly under the ridgepole. The dynamite was wrapped in brown paper, and the birds built their nest on this, roofing it over and entering the nest by a hole in the side. When the dynamite was wanted the basket was taken down and the nest with its complement of eggs was discovered. Although it was carefully replaced, the birds again abandoned their home and later the nest, eggs and basket (minus the dynamite), were deposited in the collection of the Boston Society of Natural History (see Fig. 86).

Dr. Wyman Richardson writes that he saw a Carolina Wren at Marion, Massachusetts, on April 28, 1913, and that a pair of these birds had nested there for four consecutive years, and that he had seen the nest. Mr. Roscoe I. Giles of Marlborough, Massachusetts, records a nest in Westborough June 8, 1921, with four eggs. Mr. J. E. Norton Shaw informed me that on June 29, 1926, he found the bird nesting in Marion, Massachusetts. The nest was built on a beam in a little recess in a sawmill, and was mostly constructed of trimmings from the shingle machine. All the eggs but one were hatched and the birds did not appear to be troubled by the noise of the machinery.

The Carolina Wren is non-migratory. It stays throughout the year in its chosen location, but it is not a very hardy bird, and a severe winter will destroy most of the individuals in the northern part of its range. Thus its northern distribution is limited, like that of the Mockingbird. During the summers succeeding mild winters, the number of Carolina Wrens increases in the middle states and northward and many young or unmated birds wander into northern states. During the next severe winter most of these birds succumb to cold and starvation. As the Carolina Wren gets most of its food on or near the ground, deep snow is fatal, but a succession of mild winters will favor another increase. The winter of 1903–04 was regarded at New Bedford, Massachusetts, as the most severe in the ninety-nine years during which records had been kept and the

next winter was also very inclement. Undoubtedly these two winters destroyed most of the few Carolina Wrens then in New England, as they disappeared from localities where they formerly bred. Milder winters followed and in 1907, 1908 and 1909 the wrens appeared in unprecedented numbers in New England. Dr. C. W. Townsend reported a considerable number of New England records in 1909.[1] In the winter of 1911–12 heavy snow remained on the ground for a long time and this was followed by another decrease in the number of the birds. Again from 1912 to 1917, with comparatively mild winters, the birds increased and once more in the hard winter of 1917–18 they were very greatly reduced in numbers as far south as Washington, D. C., as recorded by Dr. Alexander Wetmore.[2] Again they gradually increased until the winter of 1921–22, when a heavy snowfall reduced their numbers once more. Since then their numbers in New England have increased again, but probably the species will never become generally common here.

The food of the Carolina Wren, according to an examination of 291 stomachs made at the Biological Survey, consists of 94.18 per cent animal matter, nearly all insects, and 5.82 per cent vegetal matter, chiefly seeds. It destroys many important pests including many species of weevils, among them the cotton-boll weevil, cucumber-beetles, bean-leaf beetles, flea-beetles, many bugs including the grain-eating chinch-bug, caterpillars, moths, grasshoppers, crickets, cockroaches and their eggs, flies, spiders, and millipeds, lizards, tree frogs and small snakes.[3] Its vegetal food consists mainly of wild fruit and seeds.

Perhaps nothing is more attractive to the Carolina Wren or indeed to any wren than a safe place of refuge such as a large pile of brush and where this is provided with a constant supply of food near-by, the bird will remain all winter. Mrs. George H. McGregor, of Fall River, Massachusetts, reported that a Carolina Wren that came to her feeding station in 1923 fed on ground peanuts and suet. Mr. John Willison, of Watertown, reports another that fed on suet and the marrow from a marrowbone. Mr. Don V. Messer, of Huntington, says that a Carolina Wren visited his feeding and trapping station and inspected all the baits until it discovered some hamburg steak, which it attacked with enthusiasm. When this bait was placed in a trap the bird was easily taken and banded.

Economic Status. The Carolina Wren apparently is an important enemy of the cotton-boll weevil and many insect pests, and as it commits no noticeable depredations it is one of the most useful birds in the regions where it is numerous.

Thryomânes bêwicki bewicki (Audubon). **Bewick's Wren.**

Other name: LONG-TAILED HOUSE WREN.

Description. — A rather small wren with form rather slender, bill slender, *tail longer than wings, lower plumage chiefly grayish* and outer tail-feathers tipped grayish-white. *Adults in breeding plumage:* Above brown, brightening on rump and upper tail-coverts; greater wing-coverts barred indistinctly with

[1] Auk, Vol. XXVI, 1909, pp. 263–269.

[2] Auk, Vol. XXXVI, 1919, p. 289.

[3] Beal, F. E. L., McAtee, W. L., and Kalmbach, E. R.: United States Department of Agriculture, Farmers' Bulletin No. 755, 1916, pp. 8–10.

dusky, flight-feathers (especially tertials) barred more distinctly with same; outer webs of primaries brown, inner webs dusky; upper tail-coverts and middle tail-feathers brownish-gray, latter barred with dusky, outer tail-feathers largely very dark clove-brown, marked on outer webs and broadly tipped grayish-white; conspicuous broad buffy-white stripe over eye, a brown line through it widening below and behind it into a patch covering much of ear-coverts; below grayish, often becoming paler on abdomen, and tinged brown on sides and flanks; under tail-coverts whitish broadly barred dusky; wing linings whitish spotted dusky; "bill blackish above, bluish below; iris dark sepia; legs and feet lavender-gray" (Allan Brooks). *Adults in winter plumage:* More brightly colored above and below than spring adults; middle tail-feathers browner; sides and flanks tinged brown; white of under tail-coverts replaced by buffy or brownish. *Young in first winter plumage:* Similar to adults, but feathers of upper breast more or less distinctly edged grayish or dusky, and under tail-coverts less distinctly barred and more brownish. *Young in juvenal plumage:* Similar to adults above, but duller, and spotted or mottled on chin, throat and upper breast with dusky.

Measurements. — Length 5.00 to 5.50 in.; spread 6.90 to 7.15; folded wing 2.00 to 2.25; tail 2.10 to 2.40; bill .50 to .55; tarsus .62 to .75. Female smaller than male.

Molts. — Few molting specimens were available for examination, but the molts seem to be similar to those of the Carolina Wren (see page 334).

Field Marks. — Size smaller than Chipping Sparrow, with tail relatively longer than small eastern wrens.

Voice. — Ordinary note a soft, low *plit* (Robert Ridgway); also a finer rattle than that of Carolina Wren (A. W. Butler); song, said to be finest of the wren songs; the following forms have been noted, *"swe'e-terrr, willy, willy, willy; sweeter-we'e-lie, dong-kerwillits; swe'-ter-link-a-link-a-link; swee-wee, chow, chee-weely"* (W. L. Dawson); *"chip, chip, chip, te-da-a te-dee; cheep cheep che-we-e-e-e; whee-to-weet, a-her, che-chee;* and *chick, click, for me-e, for you"* (A. W. Butler).

Breeding. — Almost anywhere that suitable cavities may be found for its nest, but now seems to prefer human habitations and their neighborhood, and is even more inclined to human association than is the House Wren. *Nest:* In hole in stump, old tin can, old stove pipe, cup, or in any small cavity or receptacle about a building; composed of twigs, leaves, chips, dried grasses, hay, rootlets, spiders' webs, etc., and warmly lined with soft material such as fur, hair and feathers. *Eggs:* 4 to 6 usually (11 in one case, probably the product of two females); .60 to .70 by .48 to .55 in.; ovate or rounded ovate; white or pinkish, spotted and dotted with numerous reddish-brown and lilac, or purplish marks, most densely distributed toward larger end; figured by A. R. Dugmore in "Bird Homes," Plate B, Fig. 17. *Incubation:* Period 10 to 15 days (F. L. Burns). Two or three broods yearly.

Range. — United States east of the Plains. Breeds chiefly in Upper Austral Zone from southeastern Nebraska, central Iowa, northern Illinois, southern Michigan, northern Indiana, northern Ohio, central Pennsylvania and southern New Jersey south to northeastern Texas, central Arkansas, northern Mississippi, central Alabama and central South Carolina and west to northeastern Oklahoma; unrecorded from most of the Atlantic coast; winters from central Kansas, southern Missouri, southern Illinois, central Ohio and District of Columbia (casually) south to southeastern Texas, southern Louisiana, southern Alabama and central Florida; accidental in Ontario and New Hampshire.

Distribution in New England. — Accidental visitor. Records: *Maine:* Doubtfully recorded at Seguin Island. *New Hampshire:* Alton, April 25, 1890, bird shot and preserved in the collection of Ned Dearborn.[1]

Haunts and Habits. Bewick's Wren is even more attracted to the vicinity of man's dwelling than is the House Wren. Indeed the bird is often called House Wren or Long-tailed House Wren. It resembles somewhat the Long-billed Marsh Wren, though larger,

[1] Dearborn, Ned: A Preliminary List of the Birds of Belknap and Merrimack Counties, New Hampshire, 1898, p. 32.

and it is not improbable that some of the sight records of this marsh wren in winter in New England should be credited to Bewick's Wren, as it is a hardy bird.

I have never had an opportunity to study its habits, and therefore quote as follows from Robert Ridgway, one of the foremost of American ornithologists: "No bird more deserves the protection of man than Bewick's Wren. He does not need man's encouragement, for he comes of his own accord and installs himself as a member of the community, wherever it suits his taste. He is found about the cow-shed and barn along with the Pewee and Barn Swallow; he investigates the pig-sty; then explores the garden fence, and finally mounts to the roof, and pours forth one of the sweetest songs that ever was heard. Not a voluble gabble, like the House Wren's merry roundelay, but a fine, clear, bold song, uttered as the singer sits with head thrown back and long tail pendant, — a song which may be heard a quarter of a mile or more, and in comparison with which the faint chant of the Song Sparrow sinks into insignificance. The ordinary note is a soft low *plit*, uttered as the bird hops about, its long tail carried erect or even leaning forward, and jerked to one side at short intervals. In its movements it is altogether more deliberate than either *T. ludovicianus* or *T. aëdon*, but nothing can excel it in quickness when it is pursued." [1]

Mr. Arthur H. Howell speaks of the musical powers of this wren compared with those of other birds as follows: "I have listened many times to the songs of the Texan Bewick Wren, whose musical talents apparently are fully equal to those of the eastern subspecies. The songs given by the Texas birds resembled in form and tone quality the finest song heard from the Petworth Wren, and there was an almost endless variety in the construction of the songs." [2]

Little is known of the food of Bewick's Wren, which apparently, as in the case of other wrens, consists mainly of insects, among them the cotton-boll weevil.

Economic Status. See page 333.

Troglódytes aëdon aëdon Vieillot. House Wren.

Other names: JENNY WREN; WOOD WREN.

Plate 89.

Description. — A typical short-tailed, short-winged little wren; bill sharp, tapering, slightly curved at end, not notched; shades and markings of plumage very variable. *Adults in breeding plumage (sexes alike)*: Above, brown, duller and grayer on top of head, brighter on rump and upper tail-coverts, rump with concealed rounded spots of white; back and scapulars sometimes barred (rarely lined narrowly and indistinctly with dusky); upper tail-coverts usually barred narrowly with dusky; greater wing-coverts, secondaries and tail brown, narrowly barred with blackish; primaries dusky, spotted with pale brown on outer webs, these spots paling to nearly whitish on outermost, in closed wing these spots giving the effect of lighter primaries narrowly barred with dusky; sides of head chiefly pale grayish-buffy or grayish-brown, streaked with darker brown before eye and on upper part of ear region, thus showing an indistinct

[1] Birds of Illinois, Vol. I, 1889, pp. 92, 93.

[2] Howell, A. H., and Oldys, H.: Auk, Vol. XXIV, 1907, p. 153.

light streak over eye; below dull whitish centrally, passing into pale grayish-brown or grayish-buffy on upper breast and sometimes on throat, becoming more brown on sides and flanks, where barred more or less distinctly with darker brown; abdomen sometimes streaked dusky, and under tail-coverts more or less tinged or varied with rusty-brown and barred with brownish or dusky; bill dusky above, below light purplish-flesh-color; iris brown; "feet light purplish-brown" (Allan Brooks). *Adults in winter plumage:* Similar to spring plumage, but slightly deeper and richer in color; upper plumage sometimes near chestnut-brown. *Young in first winter plumage:* Similar to adults and scarcely distinguishable; upper breast (sometimes) and throat (rarely) "flecked with brown or rusty" (R. Ridgway); "bill and feet buffy-sepia-brown, becoming darker" (J. Dwight); "gape and mouth light yellow" (A. Brooks).

Measurements. — Length 4.25 to 5.25 in.; spread 6.10 to 7.00; folded wing 1.90 to 2.15; tail 1.72 to 2.08; bill .45 to .62; tarsus .50 to .75. Female smaller than male.

Molts. — Virtually the same as those of the Carolina Wren (see page 334).

Field Marks. — Size smaller than Chipping Sparrow; tail much shorter and often cocked up; a little unstreaked brown bird with sharp bill and faint, narrow, blackish bars on wings and tail; resembles the Winter Wren, but is larger, tail longer, and plumage usually lighter, especially below, than in the Winter Wren; it does not bob its head in the manner characteristic of that bird; also the House Wren is rather seldom seen in the woods which the Winter Wren inhabits. Bewick's Wren, sometimes called "House Wren," is larger, with longer tail. Marsh Wrens are almost never seen away from open marshes and meadows, which the House Wren does not frequent.

Voice. — Scolding or alarm note, a harsh, grating chatter. Song, a rather loud, hurried, bubbling outpouring, shrill, ecstatic and indescribable; varied but not nearly so musical as the song of the Carolina Wren.

Breeding. — Usually about or near human habitations; on farms or in villages, in old orchards, or more rarely on the edges of woodlands or near some woodland opening. *Nest:* Commonly in hollow tree, woodpecker's hole, nesting box or some convenient cavity about a building; usually not more than eight or ten feet up, but sometimes higher; composed of sticks, twigs and grass chiefly, and lined with hair, feathers or similar warm material, cocoons sometimes used. *Eggs:* 5 to 12; .58 to .70 by .46 to .53 in.; from short rounded ovate to nearly oval; pinkish-white, spotted and dotted thickly with reddish-brown, or cinnamon-brown and lavender; sometimes these spots gathered mainly in ring round large end; figured by E. A. Capen in "Oölogy of New England," Plate II, Figs. 12, 13. *Dates:* April 20 to July 3, Indiana; April 20 to June 27, Virginia; May 25 to June 5, Massachusetts; June 5 to August, New Hampshire. *Incubation:* Period between 11 and 13 days (O. W. Knight); about 14 days (R. Ridgway) (C. J. Anderson); by female chiefly, male assisting. One or two broods yearly, sometimes three.

Range. — Temperate eastern North America south to northeastern Mexico. Breeds chiefly in Transition and Upper Austral zones from northern Michigan, southeastern Ontario, southwestern Quebec, northern Maine and northern New Brunswick south to southern Kentucky and southern Virginia and west to Indiana; winters from central Alabama (probably), central Georgia and eastern South Carolina south to southern Tamaulipas, southern Texas, southern Alabama (probably) and southern Florida; casual in Nova Scotia.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Uncommon to locally common summer resident. *Massachusetts, Rhode Island and Connecticut:* Locally common summer resident, most common in Connecticut.

Season in Massachusetts. — April 23 to October 4.

Haunts and Habits. The House Wren is a modestly colored, cunning little elf, but true modesty is not in him. His is a character that makes its mark. He is a bold and happy warrior, and wherever he is there is "action." Let an enemy appear and Mr. Wren becomes a perfect spitfire, while his mate nobly seconds his efforts, and when there

is no enemy in sight he whiles away his time by building another nest or by fighting with his mate. When the young are hatched he should find business enough while filling the hungry little mouths in the nest, but even then he snatches time to sing and to poke his bill into the business of his neighbors and sometimes into their eggs. Nevertheless on the whole he is a fairly good citizen, a good provider and a devoted parent.

Until the last quarter of the nineteenth century, the House Wren was a common bird in New England, though local and less common in the northern than in the southern parts. But when the House or "English" Sparrow came, its advent was soon followed by a rapid decrease in the number of House Wrens. When the latter came back in the spring from the south, they found the sparrows intrenched in their nesting boxes, which were filled with a mass of rubbish, and although the House Wrens are great fighters, they were unable to stand against a mob of the larger "English" Sparrows that gathered to repel them. The disappearance of House Wrens was progressive from about 1875 to 1883, and after that they became rare and local. A few still remained in isolated old orchards and that was all.

Since the recent decrease of the "English" Sparrows, and following a campaign of bird house building, the House Wren has come back. In 1917 we began to hear of more House Wrens, and in the summer of 1918 they came back to many places all over Massachusetts and in southern Maine where they had not been seen for years. After that their increase and dissemination continued until they became common locally, even in northern Maine and some southern parts of the Canadian Provinces. The introduced Starling is now checking this increase in much the same manner as was done by the sparrows. Protection against the Starling calls for the building of nesting boxes for wrens with the entrance a mere slit seven-eighths of an inch high and at least three inches wide. This will enable the Wrens to carry in their sticks with ease, and will keep out both sparrows and Starlings. Often House Wrens will not use the usual wren box with a seven-eighths inch circular opening, because they find difficulty in carrying in their crooked sticks.

House Wrens usually arrive in Massachusetts during the latter part of April. Almost immediately after his arrival the male begins to sing. Next he commences to fill up with sticks such suitable nesting places as he finds in the neighborhood. When he has mated with a female, she usually throws out the sticks from one of his chosen nests and begins all over again. Between them a real nest is finally finished. Wrens have so much to do, singing, squabbling, courting, and policing about the grounds of their chosen residences that in New England it is usually late in May or June before the nest is finished and the eggs laid.

Almost any kind of a cavity will do for the reception of the nest. Among those which have been used are a hanging fish basket, a clothes-pin bag hanging up on a house, the pocket or sleeve of an old coat hanging in a shed, the fold of an unused horse blanket, the pocket of a broken-down carriage, an old felt hat on the head of a scarecrow, a leather mitten on a shop shelf, the skull of an ox or a cow stuck up on a pole or a tree, and even

a human skull in the house of a doctor. Dr. T. M. Brewer says that a pair persisted in building a nest in a wooden box open at the top, in a gig that was driven by a country physician, the father of Robert Kennicott, the ornithologist. The wrens continued their work even though the nesting material was thrown out whenever the gig was used. Dr. C. W. Townsend tells us that Mr. W. A. Jeffries recorded a pair that persisted in building a nest in a wooden pump in Swampscott, though the pump was in constant use. Mr. Jeffries had the pump handle nailed fast; then the persevering birds finished their nest and six eggs were deposited.

Sometimes a male, being disappointed perhaps in securing a mate, continues nest building on his own account, and mated males often use what little leisure time they have in building one or two nests in the neighborhood of the one where the female is incubating her eggs. These nests are rough affairs, composed chiefly of sticks or sometimes of pieces of wire poultry netting, but occasionally one may be finished by a female and used for a second brood. In any case the entrance is usually well barricaded with sticks to keep out larger birds.

Sometimes an unmated bird will attempt to rear a family. Mrs. Daisy Dill Norton writes as follows: "I wrote you this summer, in July I think, about the female wren who took possession of the Bluebird house, and, with never the ghost of a father wren to support her theory of a family, went ahead building the nest, and going through all the manifestations of a maternal wren with a family in prospect. She was around here until the end of August. She allowed no birds on her house or near her nest. She was ready to do battle with anything that appeared regardless of size. In all those weeks we never saw another wren or heard the song of the male. This morning Dr. Norton took down the house. In the exquisitely built nest inside were twelve perfect eggs." Mr. Robert Ridgway records a pair of these birds that occupied twelve days in nest building. Egg laying took seven days, incubation fourteen days, and fourteen days later the young birds left the nest.[1]

Some House Wrens may mate for life, others certainly do not. Mr. S. Prentiss Baldwin, who has many House Wrens breeding in nesting boxes on his estate, and who has attached numbered "bird bands" to the legs of each bird, says that one male mated with a certain female and while she was sitting on her eggs he left her and mated with another female, joining her in nesting in another box. The first female hatched her brood, fed them for awhile, and then apparently became enamored of another male, brought the first male back to attend to her brood, and went away with her new lover and started another family while her first mate fed and reared her first brood. Such actions would constitute a scandal in polite society. I have heard of several instances where a male House Wren was mated with two females, each with a brood, and domiciled in nesting boxes near each other. In these cases the male divided his attentions between the two, sang mostly where both could hear him, and "all was merry as a marriage bell." Possibly, however, the great majority of House Wrens, like most people, can get along with-

[1] Birds of Illinois, Vol. I, 1889, p. 96

out divorce at least for a season. Whether such inconstancy is common among birds, time and "bird banding" alone will tell.

Long ago this little bird left its forest dells to be the companion of the white man. Some when kindly treated become very tame, and one has even been known to take suet from a person's hand. But in isolated localities some still breed in the woods, where they retain much of their natural wildness.

When the young have been reared, most of the wrens leave the vicinity of houses and go into the "bush" in the last half of August. In the autumn they frequent the southern woods or their borders. In September they have a song somewhat different from the spring song, and their color is somewhat deeper than in the breeding season. Then our old friend the House Wren becomes the "Wood Wren" of Audubon, described by him as a distinct species.

The House Wren lives almost entirely on animal food, which made up 98 per cent of the contents of 88 stomachs of the species examined at the Bureau of Biological Survey. The material contained in these stomachs was composed of insects and spiders with the exception of 2 per cent of vegetal food, apparently taken accidentally with the insects. Grasshoppers and beetles made up half of the stomach contents, the remainder was caterpillars, bugs and spiders.[1] Crickets and locusts are eaten by the House Wren, which is very constant and diligent in its search for insects to fill its own stomach and to feed its numerous young.

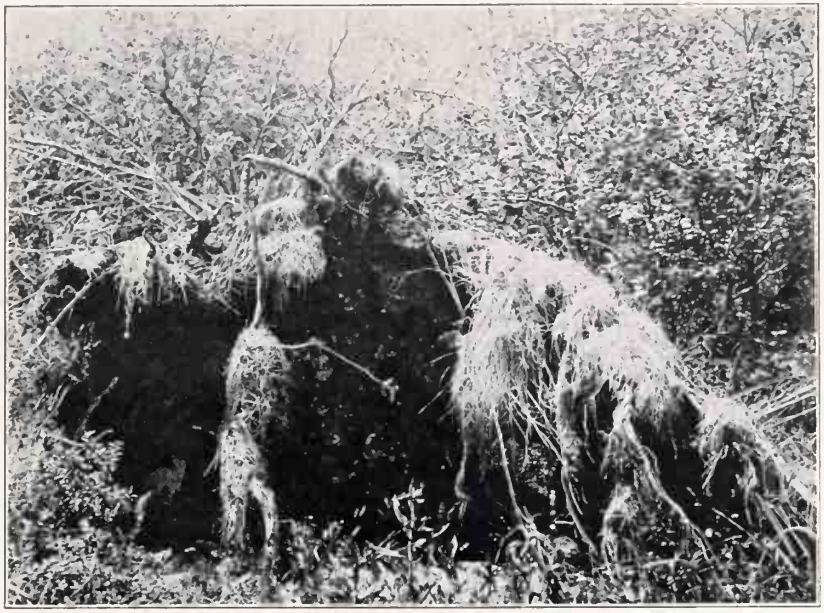
Economic Status. As the food of the House Wren consists almost entirely of insects, as only 3.03 per cent of the insects eaten are useful, and as the larger part of them, such as grasshoppers, weevils and caterpillars, are reckoned as pests, the House Wren must rank among our most useful birds. In some localities it becomes a nuisance by molesting other birds and destroying their nests and eggs, or even throwing out their young. Apparently, however, it does not eat eggs, and this destructive habit is more local than general.

Nánnus hiemális hiemalis (Vieillot). Winter Wren.

Plate 89.

Description. — Similar to House Wren, but smaller and darker, bill shorter and tail much shorter, outer tail-feathers .25 in. shorter than the next. *Adults (sexes alike)*: Above reddish-brown, lightening on rump; back, scapulars and rump barred more or less distinctly with dusky; some have whitish bars succeeding dusky ones; feathers of rump with concealed spots of white; wings colored like back, more or less distinctly barred with dusky, the outer primaries with much broader dusky bars alternating with buffy on whitish spaces; tail slightly more reddish than back or wings, narrowly barred, sometimes indistinctly, with dusky; narrow brownish-buffy stripe over eye, indistinct dark stripe behind eye; sides of head elsewhere brownish-buffy narrowly streaked with brown; below chiefly light brown, lower throat and upper breast sometimes speckled with dusky; rest of lower plumage mostly speckled or vermiculated with dusky; under tail-coverts rusty-brown barred black, with V-shaped white mark toward end; wing

[1] Beal, F. E. L.: United States Department of Agriculture, Farmers' Bulletin No. 630, 1915, p. 6.



Photograph by Miss Cordelia J. Stanwood

FIG. 88. — NESTING SITE OF WINTER WREN

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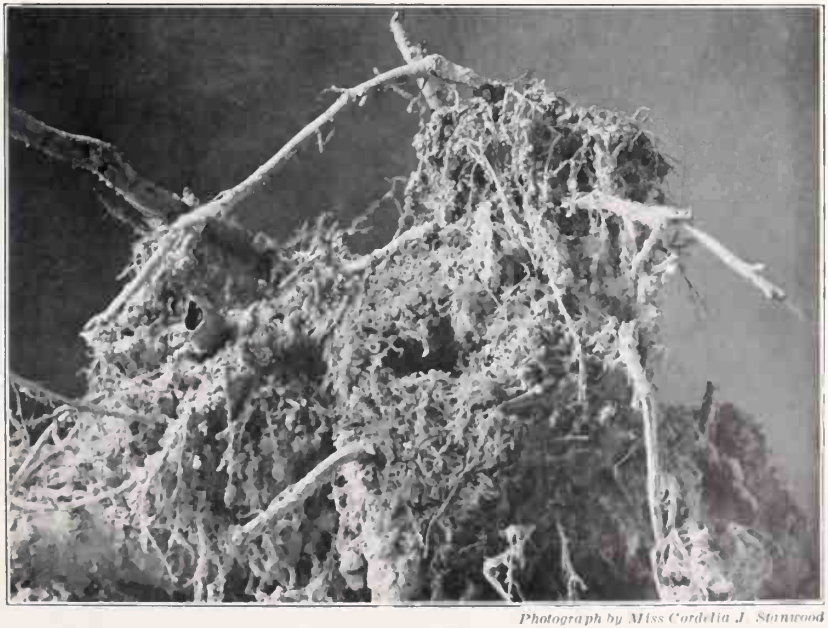

Photograph by Miss Cordelia J. Stanwood

FIG. 89. — NEST OF WINTER WREN

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linings pale grayish-brown faintly barred with dusky; "bill dark brown above, pale brown below; iris dark brown; legs and feet light yellowish-brown" (A. Brooks). *Young in first winter plumage:* As adults, but sometimes not so heavily barred. *Young in juvenal plumage:* Similar to adults, but back, scapulars and rump not barred; "bill and feet buffy-sepia-brown" (J. Dwight).

Measurements. — Length 3.50 to 4.25 in.; spread 5.50 to 6.50; folded wing 1.75 to 2.00; tail 1.10 to 1.50; bill .44 to .53; tarsus .66 to .75.

Molts. — Similar to those of Carolina Wren (see page 334). Molts into winter plumage of both adults and young take place in August.

Field Marks. — Size smaller than House Wren; a darker bird somewhat similarly barred, with a much shorter tail, almost continually bobbing its head, often cocking up its stubby tail.

Voice. — Call, a sharp *tick* repeated several times in quick succession (Wm. Brewster); a sharp *chirr*, a nervous *chimp, chimp*, or *quip-quap* (F. M. Chapman); *crrrrip*, at other times a sharp *chick* quickly repeated (R. Hoffmann); a short musical metallic *p-r-rup*, (Frank Novak); song, tinkling, rippling, full of trills and grace notes (Eugene Bicknell); surprisingly loud and ringing for such a little bird; it is long, the first part ending in a trill and the second part often ending in a trill at least an octave higher than the first, but there are many variations.

Breeding. — Usually in damp coniferous woods or thickets, near water. *Nest:* In hollow of low stump, tree or log, on ground in tangled piles of fallen trees, in a brush pile, among upturned roots of fallen trees, sometimes in a cavity or crevice in an unoccupied building, rarely suspended from a branch of a spruce tree up to 10 feet from ground; built chiefly of sticks and moss, and lined with fine rootlets, fur, hair or feathers. *Eggs:* 4 to 10; .65 to .70 by .45 to .55 in.; ovate; white, dotted more or less with reddish-brown and purple spots, often gathered about large end; figured by E. A. Capen in "Oölogy of New England," Plate II, Fig. 14. *Dates:* May 20 to July 23, New Hampshire; May 20 to August 8, Maine. *Incubation:* Chiefly or wholly by female. Usually two broods yearly.

Range. — Eastern and central North America. Breeds chiefly in Canadian Zone from central Alberta, central Saskatchewan, southern Manitoba, northern Ontario, south-central and southeastern Quebec and Newfoundland south to central Minnesota, northern Wisconsin, south-central Michigan, southeastern Ontario, mountainous regions of Pennsylvania, New York, western Massachusetts (casually) and Connecticut and through the Alleghanies to southwestern North Carolina; west in migration to central North Dakota, central South Dakota and (casually) eastern Colorado; winters from central-eastern Nebraska, northern Iowa, central Illinois, central Indiana, southern Michigan (casually), northern Ohio, central New York, southern New Hampshire and southern Maine south to southeastern Texas, southern Louisiana, southern Mississippi, southern Alabama and southern Florida.

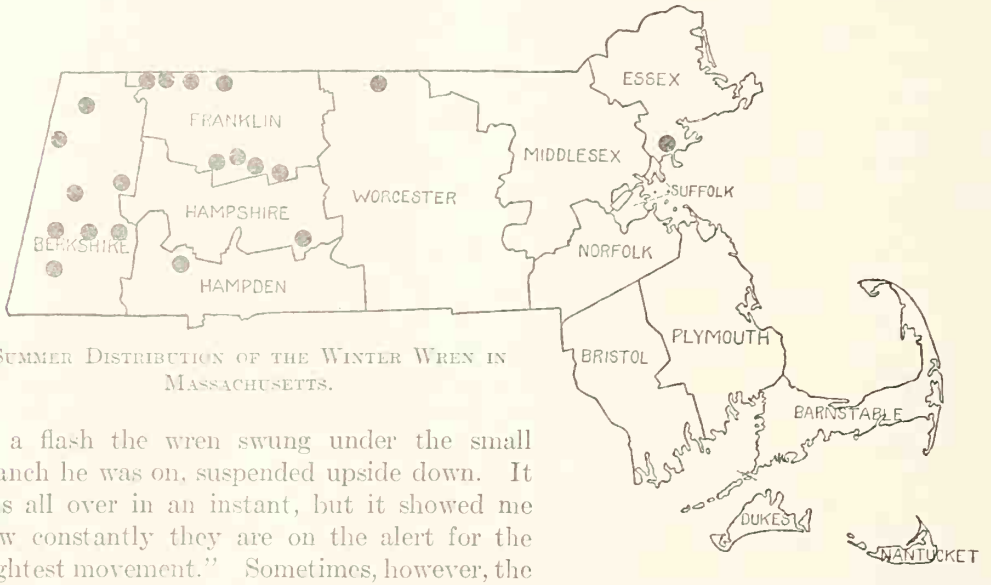
Distribution in New England. — *Maine:* Common migrant; common summer resident except in southern part, where rare or casual winter resident. *New Hampshire:* Common migrant; common summer resident in northern part, more local south of White Mountain region. *Vermont:* Uncommon migrant; common summer resident in the mountains, rare in swamps in the valleys. *Massachusetts:* Uncommon migrant; less common summer resident west of the Connecticut River, very rare or casual summer resident in northeastern counties; rare winter resident. *Rhode Island and Connecticut:* Uncommon migrant; casual summer resident and rare winter resident.

Season in Massachusetts. — April 4 to May 11 (summer); September 2 to November 5 (winter).

Haunts and Habits. When October wanes we may look with confidence for the Winter Wren. When the trees are bare and the north wind of November has drifted their scattered leaves in thicket and fen, this little Brownie of the forest creeps like a woods mouse under the roots of trees standing on banks overhanging the water, in and out of brush heaps and wood piles along river bottoms and on the banks of woodland brooks, cautious and furtive — an absurd little creature, its stub tail turned up over its

back at the least provocation, until it seems as if the bird would tumble forward, pushed over by the efforts of its own tail, or overbalanced by the bobbing of its head.

It flies little and only to move from cover to cover, where most of the time it keeps concealed. Driven from one cover it dives into the next. If unduly alarmed it may peer out for an instant in an apprehensive attitude, *chirr* or chatter once or twice, and disappear. Quick, active and extremely wary, the Winter Wren is well equipped to secure its own safety. Mr. A. C. Bagg relates the following observation: "As I was watching, a branch high above the bird came loose and fell a short distance. Quick as a flash the wren swung under the small branch he was on, suspended upside down. It was all over in an instant, but it showed me how constantly they are on the alert for the slightest movement." Sometimes, however, the little bird's propensity to run into hollow logs, holes about the roots of trees and other dark holes results in misfortune. Dr. John B. May, writing from his summer camp at Squam Lake, New Hampshire, tells me that on two different occasions Winter Wrens entered his camp buildings through knot-holes in the walls, and, unable to find their way out again, perished, their shriveled bodies being found in the buildings the next spring.



Summer Distribution of the Winter Wren in Massachusetts.

Mrs. Mary P. Hall writes that on September 30, 1926, she saw several Winter Wrens very much excited about something. They hardly noticed her, and as she came near she saw a chipmunk running with a bird in its mouth. The little squirrel sprang from the stone wall and went up a tree, dropping the bird as it did so. She picked up the victim, a Winter Wren.

As a winter bird in the latitude of New England, this wren is a disappointment. A few remain here in mild winters, but those that attempt to brave out a severe one in New England usually perish miserably. In the spring their dead bodies are found occasionally under piles of lumber or wood. Most of them winter in the South.

In spring it appears in April in our latitude and most of its numbers pass north to breed. Those that remain nest sparingly on the higher lands in southern New England, but in northern New England they are not uncommon. They breed chiefly in dark forests, near mountain torrents, about tamarack swamps and in other wild and silent places. A strip of "down timber" or a windfall where a tornado has passed is sometimes alive with them, for such tangles they seem to admire.

In the breeding season the male, losing much of his usual timidity, often ascends to a tree-top or a dead stub, from which he pours forth his loud melodious song; he sings much also while close to the ground and even in thick cover. There is considerable difference of opinion in respect to the rank of this bird as a songster. There is much variation individually in the excellence of the bird's songs, but the best of them rank high among our sylvan melodies. Thoreau says of the song: "It reminded me of a fine corkscrew stream, issuing with incessant lisping tinkle from a cork, flowing rapidly, and I said that he had pulled out the spile and left it running. . . . The note was so incessant that at length you only noticed when it ceased." The song harmonizes well with the sound of babbling brooks heard in the wild mountain glens and ravines where so often the bird breeds. At its best it is a much finer song than that of the House Wren, which it does not resemble. Nuttall says: "This wren has a pleasing warble, and much louder than might be expected from its diminutive size." Commenting on this statement, Montague Chamberlain says: "Had Nuttall ever met with the Winter Wren in its summer haunts; had he heard its wild melody break the stillness of the bird's forest home, or known of the power controlled by that tiny throstle and of its capacity for brilliant execution; had he but once listened to its sweet and impassioned tones, and the suggestive joyousness of its rapid trills; had Nuttall, in short, ever heard the bird sing, — he could not, surely, have damned it with such faint praise." [1]

Mr. E. O. Grant informs me that in September the Winter Wrens in northern Maine begin to sing "in a whisper" a song similar to that of spring, and as the month wanes the song increases in volume to nearly that of the mating song.

The Winter Wren, like the House Wren, is normally a bird of the woods, but unlike the latter it seems to shun the neighborhood and companionship of man, though occasionally it frequents woodpiles about farmhouses or camps in the woods.

The reader will look in vain for a comprehensive account of the habits and life history of this bird. In migration it is usually silent, and even on its breeding grounds you see it as a mere passing shadow in the underbrush and then it is gone. It will go into a knothole and come out at the other end of the log. It keeps it own secrets. Although I have searched assiduously where I felt sure a nest must be, I have never been able to find one. While migrating it sometimes frequents parks, and even the grounds about residences, but always with some cover near-by to which it may retreat at the least alarm.

The food of the Winter Wren is not well known; among its constituents are ants,

[1] A Popular Handbook of Ornithology, United States and Canada, based on Nuttall's Manual, Land Birds, Vol. I, 1891, p. 271.

beetles, bugs, dragon-flies, moths, caterpillars, plant-lice, mites, millipeds and snails; among forest insects taken are bark-beetles and other weevils, round-headed wood-borers, leaf-beetles, leaf-hoppers, lady-bugs and saw-flies. The Winter Wren feeds much along the banks of streams, frequently pecking at something in the water, and sometimes in its eagerness to secure its prey, it immerses the whole head. It may thus secure water insects. Miss Mabel R. Wiggins informed me that at East Marion, Long Island, New York, on October 20, 1918, Winter Wrens were feeding on the berries of the Virginia juniper or red cedar.

Economic Status. Mr. W. L. McAtee says of the bird: "Not much is known of the particular species of these pests eaten by the Winter Wren, but the riddance of any of them is welcome, and we may be sure that this incessantly active and happily singing feathered mite is a true friend of the forest." [1]

Cistothórus stelláris (Naumann). Short-billed Marsh Wren.

Plate 89.

Description. — A very small wren, with short bill, much as in Winter Wren, but a somewhat longer tail; tail moderately graduated. *Adults in breeding plumage (sexes alike)*: Above brown streaked with black or blackish and white, rump and upper tail-coverts barred with dusky and whitish; wings and tail including wing-coverts barred with dark brown or blackish, outer webs of tertials blackish spotted with pale brown, and inner webs of all flight-feathers dusky; sides of head pale brownish-buffy with a narrow line of brownish-dusky through eye and a few similar lines on ear-coverts; no very distinct light stripe above eye; below whitish washed with buffy-ochraceous on breast, sides, flanks and part of under tail-coverts; bill dusky above, paler at base below; iris dark brown; legs, feet and claws brown; bottoms of feet yellowish (N. S. Goss). *Adults in winter plumage:* Similar to same in spring, but colors richer and flanks sometimes barred with dark brownish or dusky and with whitish tips. *Young in first winter plumage:* As adults, or practically indistinguishable. *Young in juvenal plumage:* Similar to adult but darker above; throat and abdomen more buffy; breast, sides and under tail-coverts washed rusty-brown or cinnamon, palest on fore plumage where feathers tipped white.

Measurements. — Length 3.75 to 4.50 in.; spread 5.24 to 6.00; folded wing 1.70 to 1.90; tail 1.36 to 1.75; bill .42 to .50; tarsus .60 to .75. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt of body plumage, wing-coverts and possibly tertials; first breeding plumage by nearly complete prenuptial molt; adult winter plumage by complete postnuptial molt; adults have nearly complete prenuptial molt in early spring, and complete postnuptial molt.

Field Marks. — A very small brown wren, with *short bill; no distinct white stripe over eye;* throat white or whitish, thus distinguished from the Long-billed Marsh Wren, the only other wren usually found in open meadows or marshes.

Voice. — Call a *click*, like the sound produced by striking two pebbles together (E. T. Seton); song *chip-chip-chip-chip, chip-chip-chip-chir-r-r-r-r-r* (O. W. Knight); *chap, chap, chapper, chapper, chapper,* rapidly running down the scale and increasing in tempo at the same time (L. Griscom); *tip tip tip a trrrr-rrrr,* the first three notes highest, the fourth lower, and the final trilled note lowest (A. A. Saunders). This song has several variations, some much longer. It is wren-like but not very musical, and usually comes from wet grassy meadows.

[1] Roosevelt Wild Life Bulletin, New York State College of Forestry, Vol. 4, No. 1, 1926, p. 84.

BREEDING. — Usually in wet grassy meadow through which flows a small stream or river, often bordered by alder thickets, or in the upper reaches of a marsh where there is comparatively little water. *Nest:* A little round ball of grass attached to growing grass or sedge, and thus lifted above the ground, usually well concealed on a tuft, with a small hole in one side for entrance. *Eggs:* 4 to 10; .55 to .65 by .43 to .50 in.; pure white; figured by E. A. Capen in "Oölogy of New England," Plate III, Fig. 1. *Dates:* May 25 to June 18, July 7, Massachusetts. *Incubation:* Apparently chiefly by female. One or two broods yearly.

RANGE. — North America east of the Rockies, except northern part. Breeds mainly in Transition and Upper Austral zones from southeastern Saskatchewan, south-central Manitoba, southeastern Ontario, southwestern Quebec (casually), southern New Hampshire and southern Maine south to eastern Kansas, central Missouri, southern Illinois, central Indiana, northern Ohio, southeastern Pennsylvania and northern Delaware and west to central parts of North Dakota and South Dakota and eastern Nebraska; winters from southern Illinois and southern New Jersey to southern Texas, southern Louisiana, southern Alabama and southern Florida; accidental in Wyoming and Colorado.

DISTRIBUTION IN NEW ENGLAND. — *Maine, New Hampshire and Vermont:* Rare local summer resident, chiefly in southern parts. *Massachusetts, Rhode Island and Connecticut:* Local summer resident, but distribution not well known.

SEASON IN MASSACHUSETTS. — May 6 to October 9.

HAUNTS AND HABITS. The little Short-billed Marsh Wren is a bird of the fresh-water meadows, where grasses and sedges grow. If it nests in a marsh it will be found in its higher parts or near the edge, and not usually among the cattails. If it goes to the salt-marsh, as it does sometimes in its southern journey, it keeps chiefly to the drier parts of the marsh near the uplands. For breeding purposes it prefers a grassy meadow drained by a sluggish brook, creek or river and it breeds, so far as my experience goes, in such places only. If the meadow be over-drained the bird deserts it, or if it be converted into a marsh by damming its waters, the result is the same.

This wren seems to spend most of its time close to the ground, hidden in the grass. When flushed it flies feebly with fluttering wings for a short distance and tumbles down into the grass again. One who wishes to observe its habits will usually find it a very unsatisfactory subject for study, for it is hard to find. It is a great nest builder. Just how many unlined nests one ambitious male will build nobody seems to know, but where there is a large colony of these wrens, the nests are "legion," and where few birds are breeding the occupied nests are difficult to find. Usually the nests are built while the grass to which they are attached is growing, sometimes not far from the grass tops, and as it grows they are gradually raised higher from the ground. The birds themselves are so secretive and unobtrusive that it is a common experience for an ornithologist who knows them and their haunts, to find them nesting in places where the local observers who have been passing the location for years, are entirely ignorant of the presence of the birds.

The males in song take up stations on small bushes, weeds, or grass stalks in the meadow or near the edge of a fresh-water marsh, but even while singing they are usually quite shy, and will not allow a close approach; when the apprehensive bird finally dives into the grass it is all over, for he can creep off unseen through the grass. The

species is active in early morning and at night, and its notes may be heard in the meadows as twilight falls; like the Long-billed Marsh Wren it sings more or less at night. After the breeding season the bird is not entirely confined to wet meadows, but sometimes may be found in July in upland fields where the grass has not been cut. When it retires southward it frequents marshes and fields of broom grass, according to Mr. Arthur T. Wayne.

Mr. A. H. Howell says that the food of this wren, as shown by five stomachs collected in Alabama, "consists mainly of weevils, ants, bugs, grasshoppers and spiders." [1]

Economic Status. The economic status of the Short-billed Marsh Wren has not been determined. Doubtless its part in the economy of nature consists in a small share in the work of holding in check some destructive insects of the lowlands, which if not so held would increase and invade the uplands.

Telmatódytes palústris palustris (Wilson). Long-billed Marsh Wren.

Other names: MARSH WREN; CATTAIL WREN.

Plate 89.

Description. — Considerably larger than Short-billed Marsh Wren; bill longer, more slender; wings and tail rather short. *Adults in breeding plumage (sexes alike)*: Top of head dull blackish on each side and brown on more or less of forehead and center of crown; general color elsewhere above brown except back which is black or blackish streaked sharply with white; upper tail-coverts sometimes faintly barred with dusky or dark brown; middle wing-coverts sometimes with pale terminal spots and greater coverts sometimes barred dusky; flight-feathers and tail-feathers barred outwardly with dusky or blackish; inner webs of flight-feathers dusky; broad white stripe from bill over eye to back of head, where narrowly streaked with dusky, a dark line below this behind eye, sides of head below eye grayish-white shading into brown on ear-coverts and sides of neck and into white on lower jaw; below white or whitish, passing into brown on sides and flanks, upper breast usually more or less tinged with same; under tail-coverts very pale brown or brownish-white narrowly barred with brownish or dusky; wing linings whitish; iris brown; "bill, ridge brownish, rest purplish-flesh-color; gape yellow, mouth deep yellow; legs and feet pale yellowish-brown, soles yellowish" (Allan Brooks). *Adults in winter plumage:* Similar to same in spring but "colors deeper and richer." *Young in first winter plumage:* Nearly as adult winter plumage, but wings and tail usually browner and tertials and wing-coverts less distinctly barred. *Young in juvenal plumage:* Similar to first winter or adult winter but markings less distinct; the stripe above eye faint or nearly obsolete and the back very indistinctly streaked if at all; "bill and feet dusky-pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 4.12 to 5.50 in.; spread 5.00 to 7.00; folded wing 1.75 to 2.25; tail 1.48 to 2.00; bill .57 to .66; tarsus .60 to .80. Female smaller than male.

Molts. — Similar to those of Short-billed Marsh Wren (see page 348).

Field Marks. — Size, between Carolina Wren and Short-billed Marsh Wren; somewhat like Bewick's Wren but tail shorter and Bewick's Wren has no black and white stripes on back; distinguished from Short-billed Marsh Wren by larger size, longer bill, *conspicuous white stripe over eye* and blackish top of head; usually found in or near cattail marshes or salt-marshes.

Voice. — Alarm note, an energetic *tschuk* (R. Hoffmann); also an alarmed chattering. Song, a bubbling rippling but somewhat monotonous series of notes unlike those of Short-billed Marsh Wren; "there is a mixture of clicking, lisping, purring and sweet sputtering about them all which is not at all

[1] Birds of Alabama, 1924, p. 338.

unpleasant to the ear" (W. L. Dawson); song bears some resemblance to that of House Wren but more guttural, disconnected and emphatic and less musical (Wm. Brewster).

BREEDING. — Usually in cattail marshes on the shores of sluggish rivers. *Nest:* A ball of grass, flags, or rushes, etc., sometimes plastered with mud, lined with cattail down, ducks' down or feathers and suspended among flags, sedges, rushes, wild rice or bushes to which it is firmly attached and raised by their support well above the water; small entrance hole on one side. *Eggs:* 5 to 10, usually 5; .58 to .70 by .42 to .55 in.; from ovate to nearly oval; from pale brown (often so thickly dotted with chocolate-brown as to appear wholly of that color) to a dark chocolate sometimes dotted with still darker brown; figured by E. A. Capen in "Oölogy of New England," Plate II, Fig. 15. *Dates:* April 25, May 15 to June 30, Virginia; June 7 to July 28, Connecticut; June 5 to August 1, Massachusetts. *Incubation:* Period 10 to 13 days (F. L. Burns); probably chiefly by female. Two broods yearly, possibly three in some cases.

RANGE. — Extreme eastern United States and southeastern Canada. Breeds in Transition and Upper Austral zones from southeastern Ontario, southwestern Quebec and southern New Brunswick south to the Potomac Valley and coast of Virginia; winters from southern New Jersey, Long Island (New York) and southern Connecticut to South Carolina and Florida; accidental in southern Greenland.

DISTRIBUTION IN NEW ENGLAND. — *Vermont:* Common summer resident but exceedingly local, most common in Champlain Valley. *Massachusetts, Rhode Island and Connecticut:* Common local summer resident chiefly coastwise and in river valleys (most common in Connecticut); occasional winter resident.

SEASON IN MASSACHUSETTS. — April 25 to November 30 (winter).

HAUNTS AND HABITS. The Long-billed Marsh Wren is well named. It is not, like the Short-billed Marsh Wren, a bird of the meadows or the upper marsh. It is a real *marsh* wren, a bird of the cattail swamp, the quaking bog, and the oozy slough. It frequents the shores of tidal creeks, salt and brackish marshes and the marshy borders of sluggish rivers, the home of Bitterns, Soras, Swamp Sparrows and bullfrogs. It seems to be normally a bird of coastal regions, following up the river valleys as its numbers increase.

The Long-billed Marsh Wren usually arrives in Massachusetts before the middle of May. The birds soon commence their singing and nest building, and where there is a large colony the number of nests rapidly increases. The nest used for the brood usually appears old and weatherworn when compared with the extra nests that the male builds of green fresh material. Most of these nests are never used unless the males sleep in them, but their construction gives the birds an outlet for their superabundant energies. Though usually attached to reeds, rushes, wild rice or flags, they have been found in bushes and Mr. Robert Ridgway tells of nests that he found in a tide-water region of the Potomac River, that were built in small willow trees at "heights varying from six to fifteen feet above high tide." [1]

The songs of the Long-billed Marsh Wrens seem to bubble forth irresistibly though as musical efforts they do not rank high. Wilson likens their lays to the sounds produced by air bubbles "forcing their way through mud or boggy ground when trodden upon." Dr. P. L. Hatch thinks them little more than an indistinct rasping or grating sound like that produced by "a sliver on a fence rail vibrating in the wind," but in the still and peaceful night, when the full moon of June rose grandly over the river marshes and the full

[1] Birds of Illinois, Vol. I, 1889, p. 92.

chorus of the wrens was at its flood, sounding from far and near, I have joined with Mr. Brewster in listening with much pleasure to the sound. They often sing from the rushes or cattails, sometimes from the water brush, and frequently rise in brief flight straight up into the air for six to twelve feet, singing as they flutter down. The male cannot resist the urgent impulse to sing while on his way to the nest with a billful of cattail down for the lining. He sometimes sings two or three times on the way, thus losing his down and having to pick it all up again.

Dr. C. W. Townsend well describes the song as follows: "The song begins with a scrape like the tuning of a violin followed by a trill which bubbles, gurgles, or rattles, depending no doubt on the skill or mood of the performer; at times liquid and musical, at other times rattling and harsh, but always vigorous. It ends abruptly but is generally followed by a short musical whistle or a trill, as if the Wren were drawing in its breath after its efforts. I have heard one sing fifteen times in a minute. The bird often reminds me of a mechanical musical toy wound up to go off at frequent intervals. Their scolding notes at times resemble those of their neighbors, the Red-winged Blackbirds." [1]

They travel along over the water by grasping the rushes or flags with their feet, and often with tail erected and slanting forward over the back they chatter their disapproval at the unhappy mortal who braves treacherous ooze and swarming mosquitoes to pay them a visit. The best way to observe them at close quarters is to float silently in a canoe along the marshy shores of a sluggish river. It is easy then to call the wrens to the margin of the stream. It is useless to look for them outside the marsh except on the occasion of a sudden flood in late May or June. Such floods submerging the entire marsh drive them to near-by upland fields and gardens. In the floods of June, the nests of Marsh Wrens in river marshes of Massachusetts are sometimes ruined and all the eggs or young destroyed.

Not much is known of the specific character of the food of the Long-billed Marsh Wren. It likes ants, grasshoppers and locusts and their eggs, caterpillars and moths, beetles, flies, bugs, mosquitoes, snails and small crustaceans. In the salt marsh at high tide, it feeds on insects which crawl up on the grass and reeds, and at low tide it feeds largely on minute marine animals which it finds on or near the ground.

Economic Status. The Long-billed Marsh Wren apparently is a harmless bird, and probably is more or less beneficial. It sometimes breaks the eggs of Bitterns, and it may attack those of other birds but we have no evidence to that effect.

Family **CERTHIIDÆ**. Creepers.

Number of species in North America 1; in Massachusetts 1.

This is a small, well marked group of about a dozen species. Those of the genus *Certhia* to which the American birds belong have a certain superficial resemblance to wrens but

[1] Birds of Essex County, Massachusetts, 1905, p. 306.

PLATE 90

PLATE 90

TUFTED TITMOUSE
Page 365

ADULT

CHICKADEE
Page 368

ACADIAN CHICKADEE
Page 373

MALE

RED-BREASTED NUTHATCH
Page 361

MALE

MALE

WHITE-BREASTED NUTHATCH
Page 356

MALE

FEMALE

FEMALE

BROWN CREEPER
Page 353

MALE

Allen Brooks.

may be known at once by the stiffened tail, of 12 stout elastic feathers, resembling that of a woodpecker and used for a similar purpose. The bill is as long as the head, slim and delicately pointed, the claws are much curved and very sharp and the bird is peculiarly fitted, like the woodpeckers, for climbing upward. Creepers inhabit the Northern Hemisphere and Australia.

Cérthia familiáris americána Bonaparte. Brown Creeper.

Plate 90.

Description. — Bill slim and considerably curved; nostrils exposed; no bristles about mouth; wings longer than in wrens, rounded; 1st primary about half as long as 2nd; tail rather long, usually slightly longer than wing, graduated, its feathers stiffened and pointed at ends; basal joint of middle toe adheres to the side toes for its whole length; claws long, strongly curved, sharp pointed; plumage rather loose. *Adults (sexes alike)*: Above rather deep brown (variable), darkest on head, more russet on rump, paling on tail-coverts, streaked with grayish-white except on rump and upper tail-coverts, rump with concealed spot of white on each feather and tail-coverts with a tiny white spot on tip of each feather; wing (except lesser wing-coverts which are light brownish-gray) chiefly dark brown or dusky, middle coverts tipped with brownish or pale buffy spots, outer webs of greater wing-coverts broadly tipped whitish and edged with buff toward bases; alula tipped whitish; a broad band of buffy-whitish crosses primaries and secondaries about midway forming a conspicuous pale angular mark on the wing; outer webs of primaries edged more or less with pale brownish-gray, secondaries and tertials edged and tipped paler or whitish; tail pale brown, inner webs dusky, sometimes indistinctly marked with undulating bars or waves of dusky; a dull whitish or pale brownish stripe above eye; sides of head otherwise brown, streaked with whitish; below white, flanks and under tail-coverts more or less tinged buffy; iris brown; "bill blackish above, pale flesh-color below; legs and feet pale brownish-white" (Allan Brooks). *Young in first winter plumage:* Virtually as adults but often not quite so dark and rich in color. *Young in juvenal plumage:* Resemble adults, but colors lighter, pale streaks on top of head rather brown than whitish; "bill and feet pinkish-buff, dusky later" (J. Dwight).

Measurements. — Length 5.00 to 5.75 in.; spread 7.00 to 8.00; folded wing 2.40 to 2.70; tail 2.50 to 3.00; bill .56 to .69; tarsus .55 to .61. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September) including body plumage, wing-coverts and tail; first nuptial plumage by wear and adult winter plumage by complete postnuptial molt; adults have only this postnuptial molt.

Field Marks. — Size, near Chipping Sparrow; a small bird, brown above speckled and streaked with whitish, and white below, that flies from near top of one tree to bottom of another and creeps up the trunk sometimes spiraling around it; a rather wide, prominent, pale band across wing.

Voice. — Call, a soft lisping *chip*, also a feeble but sharp and creaky *cree-cree-cree-cree* (N. S. Goss); song, "exquisitely pure and tender consisting of four notes, the first of moderate pitch, the second lower and less emphatic, the third rising again and the last abruptly falling, but dying away in an indescribably plaintive cadence like the sighing of the wind in pine boughs" (Wm. Brewster); *see-a-wit, wit* (C. W. Townsend).

Breeding. — Usually in deep woods; in southern New England, often in cool wooded swamps. *Nest:* Placed usually rather low on trunk of coniferous or deciduous tree beneath a loose flake of bark or in some localities in a knot hole or a deserted woodpecker's nest; composed of slim twigs and bark strips and a little moss and lined sometimes with a few spiders' cocoons, feathers and hair. *Eggs:* 5 to 9; .55 to .64 by .43 to .50 in.; nearly ovate to short rounded ovate; dull white or grayish-white sparsely covered

with small reddish-brown spots and sometimes some lighter and purplish-brown spots; figured by E. A. Capen in "Oölogy of New England," Plate II, Fig. 10. *Dates:* May 6 to 23, Massachusetts; May 31 to June 23, Maine; July 14, southern Ontario. *Incubation:* Period, probably about 15 days after the last egg is laid, as that is the period given by H. F. Witherby for *Certhia familiaris brittanica*, the English Tree Creeper; by female. One or two broods yearly.

RANGE. — North America east of the Rocky Mountains, except the northern part. Breeds mainly in Canadian and Transition zones from central Saskatchewan, southern Manitoba, south-central Ontario, southwestern Quebec, northern New Brunswick, Prince Edward Island and Nova Scotia south to southeastern Nebraska, central-eastern Iowa, southeastern Missouri, northeastern Indiana, southeastern Ontario, southern New York, northwestern New Jersey, southeastern Massachusetts and south along the Alleghanies to southwestern North Carolina; winters over a large part of its breeding range, from central Minnesota, central Wisconsin, central Michigan, southeastern Ontario, southwestern Quebec and Nova Scotia to southern Texas, southern Louisiana, southern Alabama and southern Florida; accidental in the Bermuda Islands.

DISTRIBUTION IN NEW ENGLAND. — Common migrant, less common summer and winter resident, becoming rare in summer in southeastern parts and not yet reported as breeding in Rhode Island.

SEASON IN MASSACHUSETTS. — September 12 to May 8 (summer).

HAUNTS AND HABITS. The little Brown Creeper is nothing if not thorough; he goes to the bottom of things; and having reached his objective, he climbs. He seems to be actuated by the motto "Excelsior" which is a good one for man or bird. For climbing purposes he prefers tree trunks. He climbs straight up the trunk or spirals around, and having neared one tree-top or its first branches he glides down to the bottom of another and begins all over again. The process is much like that followed by the flying squirrel who climbs a tree and then sails down to the next.

Dr. Frank M. Chapman says of the bird: "The facts in the case will doubtless show that the patient, plodding Brown Creeper is searching for the insects, eggs and larvæ which are hidden in crevices in the bark; but after watching him for several minutes one becomes impressed with the thought that he has lost the only thing in the world he ever cared for, and that his one object in life is to find it. Ignoring you completely, with scarcely a pause, he winds his way in a preoccupied, near-sighted manner up a tree trunk. Having finally reached the top of his spiral staircase, one might suppose he would rest long enough to survey his surroundings, but like a bit of loosened bark he drops off to the base of the nearest tree and resumes his never-ending task." [1]

For his purposes the Brown Creeper evidently prefers trees and "the more the merrier," and that is why we usually find him in the woods, but where there are no trees he still needs must climb and so he climbs the rocks, a sand bank, the brick wall of a city house, a fence post or a man's leg as the case may be. Down on Block Island, Rhode Island, Miss Elizabeth Dickens saw one climbing a cow's tail for want of a more promising prospect.

The bird does not "back down" as often as a woodpecker and its few attempts at descending head-first are ill-directed and awkward but if it finds a favorite food on a horizontal branch it may follow that out to the end, usually keeping to its lower side

[1] Handbook of Birds of Eastern North America, 1914, p. 482.

Photograph by Miss Cordelia J. Stanwood

FIG. 90. — NESTING SITE OF BROWN CREEPER

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Photograph by J. H. Bowles

FIG. 91. — "DECOY" NESTING SITE, OCCUPIED BY BROWN CREEPER

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suspended upside down like a fly walking on the ceiling, thus varying its usual practice. Mr. C. E. Bailey spent an hour in watching a Brown Creeper and found that in that time it inspected forty-three trees, beginning on each about two feet from the ground, which is about as high as a Ruffed Grouse could reach, and ascending for about twenty feet or about as far as it seemed to find its favorite food, going all the time around and around the trunk in a very thorough manner, after which it flew to another tree. It appeared to prefer the white oak to any other tree, probably because the oaks in that vicinity were infested with numerous insects. In that hour it progressed only about one hundred yards and at night a Creeper, probably the same one, was still in the woods near-by.

To see the Brown Creeper hitching his near-sighted way up a tree might lead one to wonder at the incessant labor of the task and to pity the poor bird, condemned to a life-time of monotonous toil, but this feathered Brownie is evidently happy and contented with his lot, and occasionally in March or April I have heard one burst into a song much longer and more ecstatic than the ones described above and bearing some resemblance to the finer song of the Winter Wren. While with us in winter the Brown Creeper often tags along with a little group of woodland birds, chickadees, kinglets, nuthatches and woodpeckers, but he is often solitary and though he may be with the winter birds he is not of them. He is so protectively colored that he has only to remain motionless on the bark of a tree to escape detection, but when observed he is very likely to retreat to the other side of the trunk.

We see the greatest number of creepers when they are migrating in April and October and only a few remain to breed in the cool swamps of eastern Massachusetts. Mr. J. H. Bowles of Tacoma, Washington, has been very successful in attracting creepers by fastening sheets of bark on trunks of trees for artificial nesting places (see Fig. 91). Probably the same expedient would succeed in New England.

The female is the nest builder. The male, however, is very attentive and may sometimes assist. She also apparently performs all the duties of incubation and brooding but the male is assiduous in feeding the young, which remain in the nest about two weeks.

We have little exact knowledge regarding the food of the Brown Creeper. It, so far as known, consists mainly of adult insects, pupæ and insect eggs, including ants, saw-flies, beetles (including weevils and leaf-beetles), flat-bugs, jumping plant-lice, leaf-hoppers, scale-insects, moths, pupæ of the codling-moth, caterpillars and cocoons of leaf-skeletonizers, also some spiders, and seeds such as pine seeds. Occasionally in winter Brown Creepers come to feeding stations and eat crumbs of suet.

Economic Status. Mr. W. L. McAtee of the Biological Survey says that "most of the insects the Brown Creeper is known to feed upon are injurious to trees and we may safely reckon this small but very close associate of trees as one of their good friends." [1]

[1] Roosevelt Wild Life Bulletin, Vol. 4, No. 1, 1926, p. 84.

Family **SITTIDÆ.** Nuthatches.

Number of species in North America 5; in Massachusetts 2.

The nuthatches as a family are ranked as intermediate between the creepers and tits. Nuthatches are rather stout, compact, flattened birds. The bill is longer than in tits and not curved as in creepers but straight and tapering. The rounded nostrils are concealed by bristly tufts as in woodpeckers. The wings are long and pointed, with ten primaries, the first very short or spurious. The tail is short, and its shafts slender so that it cannot be used for climbing as creepers and woodpeckers use theirs. The legs and feet of nuthatches are very strong and the claws are curved and sharp pointed as in creepers.

Despite the fact that they cannot use their tails to aid in climbing, nuthatches are perhaps the most expert of all birds in creeping over an upright surface such as a tree trunk, a rock or a wall, for they can progress with equal facility either upright or head downward. Their food consists chiefly of insects, but they also take certain nuts and seeds.

Economic Status. Nuthatches are believed to rank among the most useful of birds in orchards and forests as they destroy those enemies of trees which hide or hibernate on or under the bark.

Sítta carolinénsis carolinensis Latham. White-breasted Nuthatch.

Other names: WHITE-BELLIED NUTHATCH; SAPSUCKER; DEVIL-DOWN-HEAD; TOPSY-TURVY-BIRD.

Plate 90.

Description. — A typical nuthatch with straight tapering bill, large head, long wings and short tail. *Adult male:* Whole top of head, hind neck and extreme upper back glossy black; rest of upper plumage chiefly light bluish-gray including lesser wing-coverts; rest of wing-coverts and secondaries black bordered with light bluish-gray; outer webs of tertials light bluish-gray, inner webs black; primaries slaty, outer webs bordered with light bluish-gray and tipped with white; under primary-coverts and basal parts of longer primaries white forming conspicuous white patch in spread wing; two middle tail-feathers light bluish-gray, rest of tail-feathers black crossed by a broad U-shaped band of white which extends to tips of inner feathers, leaving ends of outer ones black; sides of both head and neck, and all lower plumage white or pale gray except region of vent, and under tail-coverts which are light chestnut; iris brown; "bill black, bluish at base below; feet olive-gray, legs paler" (Allan Brooks). *Adult female:* Similar to male or as male but usually (probably in immature birds) top of head more or less gray. *Young in first winter plumage:* Similar to adults of their respective sexes, but black of top of head duller in young male than in adult. *Young in juvenal plumage:* Similar to young in first winter plumage but colors not so bright, black feathers of nape faintly edged with pale buff; dark cap of female grayish rather than pure black; less white on wings and tail than in adults.

Measurements. — Length 5.00 to 6.15 in.; spread 9.20 to 11.50; folded wing 3.50 to 3.75; tail 1.75 to 2.25; bill .72 to .86; tarsus .60 to .80. Female smaller than male.

Molts. — Juvenal plumage assumed by complete postnatal molt; first winter plumage by partial postjuvenal molt (mid-July, August) involving body plumage and wing-coverts; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (July); adults have but this one molt.

Field Marks. — Size larger than Song Sparrow, but tail very short; a rather stout, compact, flattened bird, light bluish-gray above with black cap, *white sides of head and neck* (no dark line through eye), *white chin, throat and breast,* that creeps up and down the trunks and limbs of trees, often head downward.

Voice. — Call, a nasal *ank ank ank*, also many fine twittering notes so soft that they cannot be heard more than a few feet from the bird; song, resembles the syllables *to͞o-to͞o-to͞o* (R. Hoffmann); or *tew, tew, tew, tew, tew* (W. L. Dawson); *to what what what what* (H. D. Thoreau).

Breeding. — Wherever trees are numerous, in woods, orchards, or along tree-lined streets; prefers old woods of oak, maple, etc. *Nest:* Usually in a tree cavity, a deserted woodpecker's hole, a hole in a post, a bird house or nesting box, sometimes a cavity excavated by the birds in decayed wood; from 2 to 60 feet up; constructed of shreds of bark, fine grasses, fur, hair, leaves, feathers, etc. *Eggs:* 5 to 8, usually 5, very rarely 9 or 10; .70 to .83 by .55 to .63 in.; ovate or rounded ovate; white, pinkish-white or creamy-white spotted lightly with reddish-brown and lavender or lilac, spots sometimes thickest around larger end; figured by E. A. Capen in "Oölogy of New England," Plate II, Fig. 8. *Dates:* May 1, Virginia; April 20 to May 22, Rhode Island; April 3 to May 1, Massachusetts; May 1 to 15, Maine. *Incubation:* By female. One brood yearly.

Range. — Central and eastern United States (to the Plains), and southeastern Canada. Breeds in Canadian, Transition, and Upper Austral zones from central-northern North Dakota, northern Minnesota, northern Michigan, southern Ontario, southern Quebec and Newfoundland south to central-northern Texas, central Oklahoma, northern Missouri, central Illinois, central Indiana, Ohio, West Virginia and Virginia and west to eastern South Dakota, eastern Nebraska, Kansas and central Oklahoma; winters over all but extreme northern parts of its range; casual in northern Manitoba.

Distribution in New England. — *Maine, New Hampshire and Vermont:* Common migrant; common to uncommon or rare and local summer resident; rather uncommon winter resident. *Massachusetts, Rhode Island and Connecticut:* Common migrant and winter resident; less common to uncommon local summer resident.

Season in Massachusetts. — Resident all the year.

Haunts and Habits. No other bird can compete with the nuthatches in running up and down a tree trunk. They are so often seen creeping head downward that some country people call them "Devil-down-heads" or "Upside-down-birds." They seem to have taken lessons of the squirrel which runs down the tree head first, stretching out his hind feet backward and so clinging to the bark with his claws as he goes down; but the nuthatch having only two feet has to reach forward under its breast with one and back beside its tail with the other, and thus, standing on a wide base and holding safely to the bark with the three fore claws of the upper foot turned backward it hitches nimbly down the tree head first — something that other birds hardly attempt — and it runs around the trunk in the same way with feet wide apart.

Nuthatches are called resident birds, that is, they are found both winter and summer in the latitude where they breed, but in winter they are wide rangers and at that season often appear in localities or regions where they never breed. At this time they usually travel about singly or in pairs. Nevertheless at night several birds may resort to a rendezvous in some hollow tree where they sleep in company, safe and warm. Their winter movements are governed largely by the abundance or scarcity of food such as appeals to a nuthatch. Nevertheless there is a winter movement out of the northern part of their range and a return to it in spring of the individuals that breed there. They seem to be quite regular in returning to the same wintering grounds, as birds banded in Massachusetts and Connecticut in autumn or winter have returned to the places where they were banded at about the same time in succeeding years.

As spring approaches the male begins his courtship. He becomes very gallant and attentive to the female and even shells seeds for her and passes her the freed kernels. He often displays his plumage by ruffling up his feathers and spreading the wings partly and tail fully so as to show their black and white markings, and then slowly oscillating. This flashing display of quickly increased size and conspicuous colors is used also to drive other birds away, for the male nuthatch is a brave little bird; one alone defeated and drove away a pair of pugnacious English Sparrows. The female searches diligently for hair or feathers with which to line her nest and boldly takes them wherever she can find them. Mrs. Sibbel Turnbull saw one snatch a mouthful of nesting material from a Robin. Mr. Maurice Broun tells me that he saw one come down from a tree and hop along the ground until it reached a dead squirrel from which it plucked a bunch of hair nearly as large as its own head.

The female usually does most of the nest building but the male brings considerable material which he passes into the hole for her to use, and he also brings food and feeds her, particularly while she is incubating her eggs.

When the young have hatched both parents tend them assiduously. While the female broods them the male hurries about to find food which he gives her to eat or to feed to the young as she sees fit. Evidently she is the mistress of the home. For some time after the young leave the nest the little family keeps together, only to scatter in the end and roam the winter woods with little companies composed of chickadees, woodpeckers and a creeper or two. Occasionally, however, where food is plentiful, a small band of White-breasted Nuthatches will remain together throughout the inclement season. In winter the nuthatches have a habit of storing food in the crevices of the bark of trees or in cracks of poles, under loose shingles, clapboards, etc. I have seen quantities of chestnuts thus stored by them under the flakes of the bark of a shag-bark walnut tree. Seeds and acorns are often so stored and are used by the birds in time of want when ice storms coat the trees, if the jays and squirrels have not already stolen them. They often come to feeding stations and stow away sunflower seeds or bits of suet in near-by crevices.

Nuthatches do not commonly hold seeds and nuts with one foot and crack them with the bill after the manner of the Blue Jay; they push the food into a crack or crevice and there hammer it until they come to the kernel. This habit has given nuthatches their name. They "hatch" the nut or break its shell with the bill as with a hatchet,* but they can do this only on shells that are soft or thin like those of pine seeds, some acorns and chestnuts, though witnesses claim to have seen them break walnuts. Several ornithologists have doubted that they ever break nuts of any kind. There is credible testimony however to support the statement. Dr. C. W. Townsend says that he has twice observed the habit.[1] Mr. C. J. Maynard says that they sometimes eat acorns. Mr. H. E. Childs wrote to me on December 26, 1919, that he had just seen one "opening a hickory nut" that it had wedged into the bark of the tree. Others make similar statements. Much

* An old English definition of the word is "to cut" with special reference to cutting wood.

[1] Birds of Essex County, Massachusetts, 1905, p. 308.

of the food contained in stomachs of this species examined by experts consisted of nuts and acorns.

Mr. S. D. Robbins relates an interesting experience while feeding some of these birds in winter. He said that there were some wires stretched in front of the board on which he fed the birds and when a nuthatch tried to alight on this he fell off. Also when he lit on the board "his stomach dragged" but in time a pair of the birds learned to perch on the wire like any other bird and to walk on the board properly with the body raised from it. These two birds viciously attacked some chickadees that came to feed with them and actually killed three by pecking them on the head. One of the nuthatches learned to feed from his benefactor's hand. Once its bill happened to strike the quick under a finger nail so that because of the pain Mr. Robbins relaxed his hold on the nut. Thereafter whenever he held the nut too tightly the bird pecked under the finger nail until he let go and made no attempt to eat the nut in his hand as it had done before.

This bird seldom goes to the ground, nevertheless I once noted a pair that spent an entire forenoon going over the chips left under a large tree from which the loose bark had been scraped. The birds picked over this material very thoroughly in their search for insects and insects' eggs. In winter, like other winter birds, whenever water is not available they go to the ground to get snow in place of their usual drink, and as spring comes on they take sap from the perforations made through the bark of trees by sapsuckers, but so far as I know they do not make holes for this purpose. They take sap, however, wherever they find it flowing from recently cut stumps or from broken limbs of birches or maples and this habit has given them wrongfully the name of "Sapsucker" in some sections.

When nesting time comes the birds usually find a cavity in a tree for a nesting-place. Occasionally a pair dig out a hole in a decaying trunk. Deciduous trees are commonly chosen. More rarely they find some aperture like a knot hole in some rough building and nest on a beam or between the inner and outer walls.

Dr. Eleanor Mellen says that at her feeding station the nuthatches show considerable alarm just before a storm as they fly frantically about from one nesting-box to another, going in, hurrying out and trying the next one, then flying straight up in the air and diving down again. She says that she has noted this habit for several years, and that no other bird acts in the same manner.

Occasionally in winter one of these birds is overcome by the rigors and gales of the inclement season. During a terrific snowstorm about February first, 1926, Mrs. Joseph Fossel of Farnumsville, Massachusetts, found one on her veranda apparently dying. She took it in, warmed and fed it, and kept it about four days. When it had recovered, it was released apparently as well as ever. While confined the bird seemed perfectly contented and accepted the attentions and food given it without manifesting the least alarm. It was fed on mockingbird food, grated carrot, worms, scraped raw beef and suet.

On the morning of November 25, 1921, Mrs. Augusta L. Gardner of Bucksport, Maine, came down into her living-room, when a White-breasted Nuthatch flew out of the fire-

place. She was positive that the bird must have come down the chimney since there was no other possible way for it to enter the house.

In spring, summer and early autumn the White-breasted Nuthatch feeds very largely on animal food, chiefly insects and spiders. Mr. Francis A. Foster watched one in October, on a treeless section of Gay Head, Massachusetts, hunting for insects under the sheltered and projecting parts of the houses. The bird could have found seeds and acorns in plenty on the island.

Even in winter animal matter amounts to 25.7 per cent of the food eaten and seeds 67.4 per cent according to Professor F. E. L. Beal, while the food for the whole year averages 50 per cent insects and spiders. In winter one-half the vegetal food is acorns, nuts and large seeds, such as those of pines, firs, maples and large sunflowers; galls and wild fruits are eaten and about 10 per cent of grain, chiefly waste. Among the wild fruits eaten are the berries of the Virginia juniper and mountain ash. Rotten apples left on the trees in winter are eaten freely. In spring insects form over 79 per cent of the food. Among the pests taken by this bird are scale-insects, nut-weevils, locust-seed weevils, leaf-beetles, plant-lice and their eggs, snap-beetles, wood-boring beetles, ants, flies and eggs of the canker-worm moth. The stomach of one bird taken in my orchard contained 1,629 eggs of the fall canker-worm moth. The bird eats the hairy larvæ of the gipsy moth and the forest tent-caterpillar. Grasshoppers and locusts are eaten when these insects are unduly abundant. At feeding stations the bird eats suet or other fat, and seeds of the sunflower, squash and pumpkin — the last two are usually cut in halves before they are put out.

Economic Status. Professor E. D. Sanderson examined the stomach contents of 23 of these birds taken in winter and 11 in early spring, and from the results of the examination of this small number, not one of which was taken in an orchard infested with insect pests and without any reference to the food for the rest of the year or that of the young, he considered the bird as probably neutral, as the number of beneficial insects taken fully equaled the number of injurious species. Others who have made more extended investigations regard this nuthatch as decidedly beneficial. In respect to its presence in the woodlot Mr. W. L. McAtee says: "In the long run, the White-breast, no doubt, destroys a large number of forest pests, and while not so valuable as some of the more highly insectivorous birds, still deserves protection."[1] The utility of nuthatches in orchards may be judged from a report by Professor H. A. Surface. It seems that a pear grower near Rochester, New York, lost his entire pear crop by the pear-tree psylla, an exceedingly destructive pest. In the autumn the eggs of the pest were so numerous that there was little prospect of a crop the following year, but during the winter both White-breasted Nuthatches and Red-breasted Nuthatches came in numbers to the orchard and in the spring hardly an insect could be found on those trees. Professor Surface asserts that these birds saved the grower thousands of dollars in that one winter.[2]

[1] Roosevelt Wild Life Bulletin, Vol. 4, No. 1, 1926, p. 85.

[2] Zoölogical Quarterly Bulletin, Division of Zoölogy, Pennsylvania Department of Agriculture, Vol. V, 1907, p. 79.

Sitta canadénsis Linnæus. Red-breasted Nuthatch.

Other names: RED-BELLIED NUTHATCH; CANADA NUTHATCH; DEVIL-DOWN-HEAD; TOPSY-TURVY-BIRD.

Plate 90.

Description. — Form, similar to that of White-breasted Nuthatch, but even more shortened and chunky and considerably smaller. *Adult male in breeding plumage:* Top of head black with faint bluish gloss; elsewhere above, chiefly bluish-gray including middle pair of tail-feathers; secondaries and primaries slate-color with gray edgings; tail-feathers (except middle pair) black, two or three outermost with an interrupted band of white toward tip or with a white spot on each feather; a white stripe above eye and a black stripe through it, bordered below by white, and all extending from bill down side of neck; chin and upper throat whitish, passing into pale buff on throat, into more tawny or deeper buff below and fading again on longer under tail-coverts; iris brown; "bill black, bluish at base below; legs and feet pale olive-green including claws, soles yellow" (Allan Brooks); one specimen taken in May had "legs and feet dull greenish-yellow; claws light brown" (N. S. Goss). *Adult male in winter plumage:* Similar to breeding plumage, but brighter, and lower plumage more tawny. *Adult female:* Similar to male, but black of cap replaced by gray or plumbeous, usually deeper than color of back, that of side of head dull or slaty, and lower plumage averaging paler. *Young in first winter plumage:* Similar to adults of their respective sexes in winter plumage, but if anything the dark cap is duller and a trifle less sharply defined on sides of head and they are paler below. *Young in juvenal plumage:* Somewhat paler than autumnal adults, thus resembling pale summer adults, white streak above eye speckled with black; chin and sides of head white with dusky feather-edges; below mostly pinkish-buff with sometimes a few dusky feather-edges on breast.

Measurements. — Length 4.10 to 4.75 in.; spread 8.00 to 8.50; folded wing 2.60 to 2.85; tail 1.35 to 1.50; bill .53 to .61; tarsus .60 to .75. Female smaller than male.

Molts. — Similar to those of White-breasted Nuthatch (see page 356).

Field Marks. — Size smaller than White-breasted Nuthatch and even more "chunky"; darker bluish-gray above and buffy or brownish below with a *black or dark stripe through eye;* moves up or down a tree trunk head first; a very nimble, active, nervous bird.

Voice. — Call, a high-pitched nasal *ank ank,* another like *hüt* higher and a little sharper than that of the White-breasted Nuthatch (R. Hoffmann); call by male in breeding season *yeait, yeait, yeait,* repeated several times (O. W. Knight); a low twittering that can be heard only when quite near the bird. Song, a fine, sweet trill of seven or eight syllables uttered while on the wing (Miss J. O. Crowell).

Breeding. — Chiefly in northern coniferous forests; at times in mixed woods. *Nest:* Usually in a cavity excavated by the birds in decaying part of softwood stub from 5 to 70 feet from ground, with an entrance hole nearly an inch in diameter; composed mostly of shreds of bark, often lined with feathers, or else no nest made and eggs laid on chips in bottom of hole; pitch is usually smeared on the bark about the entrance hole. *Eggs:* 4 to 8, the larger number rarely; closely resembling those of White-breasted Nuthatch or Chickadee but smaller than the former and probably averaging larger than the latter; about .59 to .65 by .45 to .54 in.; figured by E. A. Capen in "Oölogy of New England," Plate II, Fig. 9. *Dates:* May 18 to June 10, Massachusetts; May 6 to June 2 (early July), Maine; May 10 to June 1, New Brunswick. *Incubation:* Period 12 days (F. L. Burns); chiefly by female. One brood yearly.

Range. — North America. Breeds chiefly in Canadian Zone from southeastern Alaska, central Yukon, southwestern Mackenzie, northern Manitoba, northern Ontario, southern Quebec, southern Labrador and Newfoundland south to southern Alberta, southern Saskatchewan, central Minnesota, southern Wisconsin, northern Illinois (casually), northern Indiana, southeastern Ontario, southern New York, northern Connecticut and southeastern Massachusetts and south in the Sierra Nevadas and Rockies to south-central California, central Arizona and southern Colorado, and in the Alleghanies to southwestern North Carolina, also on Guadalupe Island (Lower California); winters from southern British Columbia, central Saskatchewan, southern Quebec and Nova Scotia south to Guadalupe Island

(Lower California), southern New Mexico, southern Arizona, southern Texas, southern Mississippi and northern Florida; accidental in the Bermuda Islands.

Distribution in New England. — *Maine:* Common resident except in southwestern part where periodically common winter resident. *New Hampshire:* Common resident from White Mountains north; southward a rare summer resident and irregular in fall and winter. *Vermont:* Uncommon winter visitor and local summer resident, breeding at all altitudes. *Massachusetts:* Irregular fall and winter visitor or winter resident; uncommon summer resident on higher lands of western counties; rare summer resident in eastern part. *Rhode Island and Connecticut:* Rather uncommon and irregular fall and winter visitor.

Season in Massachusetts. — August 14 to May 27 (summer); most numerous in migration in April and in September and October.

Haunts and Habits. The dumpy little Red-breasted Nuthatch when seen among our other feathered tree-climbers seems like a small boy at play among his elders. Nevertheless it is quite as interesting as any. In winter it consorts more or less with other nuthatches, chickadees, woodpeckers and creepers, but during migration is often seen among the branches and foliage with the warblers. It prefers pine and other coniferous trees, but often may be seen in deciduous trees. A few appear in southern New England every winter as some breed here, but when the cone trees of the Northland fail to produce a crop of seeds and those of southern New England produce abundantly, we may expect a multitude of Red-breasted Nuthatches. In such years some begin to appear in southern Maine by the second week in July, and the fore-runners of the flight reach Massachusetts in the latter part of that month, becoming rather common here by late August or early September. This was the case in 1921, and again in 1923 there was an early migration, the birds crossing the St. Lawrence River in August and arriving at Nantucket Island, Massachusetts, by the 30th of that month. Usually, however, the migrants come later and in smaller numbers and in some years very few birds go as far south as Massachusetts. At first, on their arrival, they may be found in all sorts of places; on barren rocky islands where they climb rocks, cliffs, fence-posts or roofs, and fly off into the air after flying insects or search about in the long grass for them; in orchards and gardens, and along tree-bordered streets as well as in the woods; but soon they are attracted to cone-bearing trees, spruces, white pines and pitch pines, all of which are favorites in this latitude and it is in woods composed of these trees that they are most commonly found. Usually by November most of them have moved on but where food is plentiful many linger for the winter.

Those that remain and mate in the spring, usually dig out holes in decaying stubs with much labor, penetrating sometimes to a depth of nearly a foot. The first recorded instance of the breeding of this species in a nesting-box occurred on the estate of Mr. Henry S. Shaw, Jr., at Dover, Massachusetts, in 1915. A pair of Red-breasted Nuthatches were attracted to his place during the previous winter by a plentiful supply of suet placed in racks among the pitch pines (a favorite tree with these birds) and a Von Berlepsch nesting box hollowed from a paper-birch log was put up about seven feet from the ground on the trunk of a small gray-birch tree. The birds mated, built a

nest in the box and raised young there. I photographed the birds and their nesting box.[1]

They usually excavate for a nesting place a hole in a dead stub, fifteen or twenty feet high, in either hard or soft wood and commonly among cone-bearing trees. They first mark out the entrance by a series of small holes which form a circle about an inch in diameter, then they work inward for an inch or two and then downward as woodpeckers do. Professor O. W. Knight says that in some cases the hole is begun in March and then left until May before it is finished, and that in other instances he has known them to begin and complete a nest and lay an egg within a week, while some nests required two or three weeks to finish, and sometimes two months passed after a beginning had been made before the nest was completed and eggs laid. The habit of smearing pitch below the entrance hole or around it persists, even when the bird builds in a nesting box, as there was quite a quantity of pitch below the entrance of the nesting box at Dover. The origin of this habit and its possible utility have never been explained satisfactorily.

My friend Charles E. Ingalls found a nest in Templeton, Massachusetts, on June 10, 1894, which contained three fresh eggs of this species and two young birds about two days old, apparently Tree Swallows. This may indicate that the Nuthatches drove out the rightful owners of the nest and took possession.[2]

The Red-breasted Nuthatch is an exceedingly active little bird and is at home on any part of a tree. It climbs freely also about rocks and buildings and like the White-breasted Nuthatch occasionally goes to the ground. Its flight is undulating and it seems to fairly bound through the air. Despite its short tail it seems to turn rather readily while pursuing insects in the air. Usually it is very tame and confiding, — some individuals are exceedingly so. Miss Mabel T. Tilton of Vineyard Haven, Massachusetts, tamed one so that it came to her hand almost as confidently as a Chickadee. It took all kinds of liberties with her finger nails and seemed to enjoy warming its cold feet in her hand as it was in no haste to be off. When she attempted to put her thumb on its abbreviated tail it did not resent such familiarity by leaving, she says, "but the little thing merely turned around and continued to enjoy the scenery from the security of my hand." An interesting habit of the bird, she continues, "was its cunning little trick of driving the nut meat down between my fingers, a convenient crack to hold the food to be eaten at leisure and with many a tiny, contented squeak." Thus in her hand it exemplified its usual habit of wedging its food into a crack or crevice to "hatch" it.

At feeding stations nuthatches may be seen carrying off bits of suet, nuts, etc., and hiding them away in nesting boxes, holes in trees and cracks and crannies in the bark. Mr. A. C. Bagg writes that he noticed a Red-breasted Nuthatch carrying pieces of suet into a wren house. A White-breasted Nuthatch witnessed the act and tried to enter this storehouse of its smaller neighbor, but found himself too large to go through the doorway.

[1] Massachusetts State Board of Agriculture, Eighth Annual Report of the State Ornithologist, 1916, Plate II, p. 88.
[2] Auk, Vol. XI, 1894, pp. 331, 332.

There were four entrances, at each of which this persistent bird sought to enter, but in vain. The Red-breast had chosen its storehouse well.

We know very little about the food of the Red-breasted Nuthatch. Most of its life is spent in northern cone-bearing forests where it feeds on the seeds of spruces, balsam fir, and probably other coniferous trees. In southern New England it takes seeds of Norway spruce, white pine and pitch pine. It is known to take a considerable toll of insect life, particularly beetles, including some wood-borers, plant-lice, scales, caterpillars, hymenoptera and spiders.

Economic Status. The status of this species has not been definitely determined. It is probable that its service to the trees as a destroyer of insects more than pays for the number of tree seeds which it eats. Dr. Elliott Coues says of the nuthatches "they spend the whole of their laborious lives in Man's service."

Family **PARIDÆ**. Titmice.

Number of species in North America 15; in Massachusetts 2.

This is a large family of upward of a hundred species distributed in both the Old and the New World. The North American species are all small birds under 7 inches in length. The bill is small, much shorter than the head, straight and unnotched, without bristles, but the nostrils are concealed by tufts of bristly feathers growing from its base. The short rounded wings have 10 primaries, the first short or spurious. The tail is not longer than the wings and is composed of 12 rather narrow feathers, their tips rounded and soft, unserviceable for support in climbing and not used for that purpose. The legs and feet are stout, the tarsi scaled, the fore toes united for most of the length of the first joint of the middle toe and the hind toe has an enlarged pad beneath it, thus giving the foot with united bases of the fore toes a broad, firm sole. The plumage is soft, loose and fluffy, and usually lacks bright colors, spots or streaks, or marked seasonal or age changes.

The members of this group are not very musical or ornamental, but they are energetic, active and industrious. They are forest birds normally and are largely inhabitants of the woods in the breeding season, wandering elsewhere in winter. They are prolific and therefore usually common or abundant.

Economic Status. Professor F. E. L. Beal said of the members of this family as studied by the Biological Survey, "nearly one thousand stomachs of the different species and subspecies of titmice have been examined, and the result of careful analysis has confirmed the observations made in the field and proved beyond question that this family of birds is one of the most efficient conservators of the forest." [1]

[1] Forest, Fish and Game Commission of New York, Ninth Report, 1903, p. 253.

Bæolóphus bícolor (Linnæus). Tufted Titmouse.

Other name: CRESTED TITMOUSE.

Plate 90.

Description. — A typical gray chickadee with crown adorned with a pointed crest. *Adults in breeding plumage (sexes alike)*: Forehead sooty-black margined behind by sooty-brown and sharply defined on sides; elswhere above slate-gray; lores white passing into pale gray elsewhere on sides of head except a small black spot on upper eyelid; basal half of outer tail-feathers whitish; below whitish passing into light or pale rusty-brown on flanks posteriorly; wing linings whitish; bill black; iris dark brown; "legs, feet and claws lead-color" (N. S. Goss). *Adults in winter plumage:* As in spring except that there is a tinge of olive-brownish above and pale buffy-brownish below especially on upper breast. *Young in first winter plumage:* As adults in autumn and winter except that black of forehead may be duller, more restricted and less sharply defined. *Young in juvenal plumage:* Similar to first winter but browner above, lacking black forehead and dull grayish-white below, faintly tinged with pinkish-buff deepest on the flanks; "bill and feet dusky-pinkish-buff, becoming black when older" (J. Dwight).

Measurements. — Length 5.60 to 6.50 in.; spread 9.25 to 10.75; folded wing 3.00 to 3.50; tail 2.50 to 3.15; bill .44 to .49; tarsus .65 to .90. Female smaller than male.

Molts. — Similar to those of the nuthatches but taking place chiefly in August (see page 356).

Field Marks. — Size, considerably larger than Chickadee but smaller than Song Sparrow. May be known by crested head, black or blackish forehead contrasted on each side against white fore face, gray upper plumage, and white or whitish lower plumage growing rusty on flanks.

Voice. — Calls *péto péto* repeated several times, *day-tee* also repeated, also a hoarse *dee dee dee*, also a note like the fall warble of the Bluebird. Most of the notes are quite loud but there are other soft and low notes.

Breeding. — Normally in heavily timbered regions, but has adapted itself more or less to conditions about settlements. *Nest:* In natural tree cavity, occasionally in deserted hole of woodpecker, rarely in an excavation made by the Titmouse in a dead stub, stump or fence-post, or in a bird-house or nesting-box; from 4 to 65 feet up, usually rather low; composed of moss, leaves, grass, bark, hair, feathers, etc. *Eggs:* 4 to 8, most often 6; .68 to .75 by .45 to .60 in.; white, creamy-white or buff, thickly sprinkled with reddish-brown spots and more sparsely with lavender. *Dates:* April 18 to 30, South Carolina; April to May 26, Virginia; May 4 to 16, New Jersey. *Incubation:* By female chiefly. One brood yearly; said to have two in some cases in the south.

Range. — United States, mainly east of the Plains. Resident and breeds in Upper and Lower Austral zones from eastern Nebraska, northern Iowa, northern Illinois, southern Michigan, northern Ohio, Pennsylvania, southeastern New York and New Jersey south to southeastern Texas, southern Alabama and southern Florida and west to central Kansas and central Oklahoma; casual in southeastern South Dakota, southern Minnesota, southern Wisconsin, southeastern Ontario, central New York and Connecticut; accidental in Maine.

Distribution in New England. — Very rare or casual visitor. Records: *Maine:* Orono (near), 1890 (?), specimen in collection of University of Maine, taken by one of the students as reported by Professor F. L. Harvey; Fryeburg, May 10, 1918, two pairs seen, June 15, 1918, one feeding young, observed by Miss Harriet Abbott. *New Hampshire:* Doubtfully recorded. *Vermont:* At least four Vermont lists name this species but the records are unsatisfactory; a specimen in the state collection at Montpelier has no satisfactory data. *Massachusetts:* Reported several times (at least four) but no specimen taken and preserved. *Connecticut:* In addition to the assignment of the species vaguely to New Haven by the Rev. James H. Linsley in his "Catalogue of the Birds of Connecticut" (1843), there are the following records: Lyme, February 27, 1872, specimen taken and January, 1874, another seen by Josiah G. Ely; another taken near Hartford by Dr. D. Crary (no further data);[1] South Norwalk, March 10,

[1] Merriam, C. Hart: A Review of the Birds of Connecticut, 1877, p. 9.

1917, bird seen by Aretas A. Saunders, also seen by him again several times late in the month and on April 1.[1]

Haunts and Habits. The Tufted Titmouse, or Crested Titmouse as it was called formerly, is a mere straggler in New England. I have not listed it as a Massachusetts bird because although several sight records have been given me we have no record of a specimen taken in the state. Nevertheless I have no doubt that the bird has been seen wherever reported in New England as the observers are trustworthy and the bird is unmistakable at close range. I predict that it will be taken and listed eventually in every New England state, as these states are not very far from its normal range and individuals are prone to wander more or less.

As I have never had a good opportunity to study the habits of the bird I must refer the reader to the writings of others. Mr. Arthur T. Wayne says of the bird in South Carolina: "This species deposits its eggs in natural cavities of trees or in deserted holes of the smaller woodpeckers and does not appear to excavate a hole for itself. It seems to have a preference for hollows in chinquapin and dogwood trees, and the hole ranges from four to forty-five feet above the ground. While nest-building, the birds carry large quantities of material at every trip and one generally accompanies the other to and from the site. The nest is composed of wool, cotton, hair, leaves, fibrous bark and snake skins, the last article being indispensable to this species, as it is to the Crested Flycatcher. From five to seven eggs are laid, and these are white or creamy white, speckled and spotted with reddish-brown and lilac shell markings, and measure .75 by .52 inches. Some specimens are of a light buff color flecked with russet. The birds are the closest of sitters and have to be removed from the nest before it can be examined. Only one brood is raised and these follow their parents for many months.

"Although this species is supposed to breed only in cavities of trees, I found a pair breeding in festoons of the Spanish moss and herewith transcribe the account which I published in the *Auk:*

"On April 23, 1896, I noticed a Tufted Titmouse with its mouth full of building materials, and upon following it closely saw it fly into a very large mass of Spanish moss (*Tillandsia usneoides*). When it appeared again after depositing the nesting materials I was very much surprised to find that there was no hollow whatever where the moss was growing. It was followed by its mate, and made ten trips to the tree in less than fifteen minutes. Having had a good deal of experience with this species when nesting I knew it was characteristic of this bird to carry building materials to the nest even *after* the eggs were laid. I resolved to climb the tree with assistance later in the day, but a violent rain storm prevented my doing so.

"The next day, however, to my sorrow, I counted five eggs upon the ground and the nest completely blown out. Undismayed, the female began work again in the same bunch of moss, but was not encouraged at all by her mate, who would fly into a hollow near at hand and whistle for her, but she paid no attention to the hollow — just looked

[1] Auk, Vol. XXXV, 1918, p. 343.

in and left. She worked rapidly and carried huge mouthfuls at every trip. Upon climbing to the nest on May 3 I found that it contained three eggs, and left it for a full set. I was doomed to disappointment again, however, for the next day was very stormy, and upon visiting the tree I saw all the eggs on the ground and the nest, which was composed of dry leaves, hair, sedge, feathers and snake skins, blown down in a mass. The fact of the Tufted Titmouse breeding in Spanish moss is certainly a surprising departure for this bird." [1]

The habits of this bird seem much like those of the Black-capped Chickadee. It evinces similar curiosity. A good imitation of its common call is enough to entice it down from the tree-tops to within a few feet of the person who calls. Sometimes it becomes quite tame and confiding.

Mrs. Olive Thorne Miller told of a female bird that, while looking for a place to nest, entered a dwelling house by way of an open window, flew about the rooms, helped herself to whatever she could find that appeared to be good to eat and seemed to decide that as she had arrived in a land of plenty she had better stay. So she settled upon a hanging basket as a receptacle suited for nesting purposes, and not being disturbed by the family, built her nest and laid some eggs, but when the family began to take too much interest in her treasures she moved to a more retired situation. Mrs. Miller continued as follows:

"Another of these birds, in Ohio, looking about for something nice and soft to line her nest, pitched upon a gentleman's hair. Unfortunately, he had need of the hair himself; but the saucy little Titmouse didn't mind that. She alighted on his head, seized a beakful, and then bracing herself on her stout little legs, she actually jerked out the lock, and flew away with it. So well did she like it that she came back for more. The gentleman was a bird lover, and was pleased to give some of his hair to such a brave little creature." [2]

Evidently the bird considers hair a necessary ingredient in nest building. Mrs. Florence Merriam Bailey says that a young lady was astonished to find a Tufted Titmouse attempting to pull hair from her carefully arranged locks. Another bird was skilful enough to make repeated attempts on the tail of a live red squirrel until it had collected quite a mouthful of hair; [3] and another secured its hair from a living and lively dog.

The Tufted Titmouse is not migratory in the true sense of the word although after the breeding season it wanders about somewhat and unmated birds are prone to wander at any season of the year.

An examination of the contents of 186 stomachs of this species by experts of the Biological Survey has thrown some light on the character of its food. It tabulates as 66.57 per cent animal matter and 33.43 per cent vegetal. The vegetal food seems to be principally wild berries, seeds and the softer-shelled nuts and acorns. The animal food is mostly insects. Caterpillars and wasps make up over 50 per cent of the entire food.

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[1] Birds of South Carolina, 1910, pp. 194, 195.

[2] Nature Lovers Library, Birds of America, T. G. Pearson, editor, Vol. III, p. 207.

[3] National Association of Audubon Societies, Educational Leaflet No. 71, 1913.

Saw-fly larvæ, tree-hoppers, bugs including scales, insect eggs and a few spiders are taken in smaller quantities.[1]

Economic Status. As a result of this examination Professor Beal says that the bird is evidently beneficial and has no bad habits to offset its good ones.

Penthéstes atricapíllus atricapillus (Linnæus). Chickadee.

Other names: BLACK-CAPPED CHICKADEE; BLACK-CAPPED TITMOUSE; EASTERN CHICKADEE.

Contributed by Maurice Broun.

Plate 90.

Description. — Smaller than Crested Titmouse; bill short; head not crested; plumage lax and loose. *Adults in breeding plumage (sexes alike)*: Entire crown and hind neck (except lateral part of latter) uniform deep black; back, shoulders, middle and lesser wing-coverts plain olive-gray, passing into more buffy gray on rump and upper tail-coverts; wings and tail dusky-slate-color or dull blackish-slate; greater wing-coverts and secondaries broadly edged pale gray or grayish-white; tail-feathers edged light olive-gray, or nearly ash-gray, these edgings becoming white on outermost feathers; chin and whole throat black, feathers near posterior margin of this black area more or less conspicuously tipped white; sides of head and neck and under parts of body white, sides and flanks tinged with buff; bill black; iris brown; legs and feet "lilac-gray" (Allan Brooks). *Adults in winter plumage:* Similar, but much more richly colored, gray of back, etc., more buffy, rump and upper tail-coverts more decidedly buffy, sides and flanks deep brownish-buff, in strong contrast with white of abdomen, and whitish edgings of larger wing-coverts, secondaries and outermost tail-feathers broader and more conspicuous. *Young in first winter plumage:* Similar to adults and practically indistinguishable from them. *Young in juvenal plumage:* Entire crown, chin and throat dull black; under parts dull white; sides and under tail-coverts pale pinkish buff; lores, suborbital region, auriculars and sides of neck pure white; "bill and feet pinkish-buff, bill becoming slate-black, the feet grayish-brown" (J. Dwight).

Measurements. — Length 4.75 to 5.75 in.; spread 7.50 to 8.50; folded wing 2.50 to 2.75; tail 2.50 to 2.70; bill .34 to .38; tarsus .65 to .75. Female smaller than male.

Molts. — Juvenal plumage succeeds pale mouse-gray down in nestling by complete postnatal molt; first winter plumage acquired by partial postjuvenal molt (July, August), after which young bird becomes practically as adult; first breeding plumage acquired by wear; adults have annually a complete postnuptial molt (July, August); breeding plumage acquired by wear.

Field Marks. — Size smaller than Chipping Sparrow. Unmistakable, but may be confused with male Blackpoll Warbler in spring plumage; easily separated from the latter by distinct black throat, lack of black stripes on the sides, and ashy tone of upperparts; easily distinguished from *brown-headed chickadees* by intensely black instead of brown head, and by wider black throat-patch.

Voice. — A clear rasping or gurgling *chiek-a-dee-dee-dee* or *chie-chie-a-dee-dee-dee* (*dee* is repeated more or less); *day-day-day* and *tche-day-day-day* and *tche de de de de de* (H. D. Thoreau); "song" a high-pitched, clear and plaintive *phe-be* or *phe-be-be;* rarely, "singing" like a Ruby-crowned Kinglet, "only fainter and shorter, with a little of the ring of the Canary's song in it" (W. E. Cram).

Breeding. — Usually in forests or open woodland, but sometimes in orchards and even about human dwellings. *Nest:* In natural cavity, nesting box or deserted woodpecker's hole, but more frequently the birds themselves excavate a hole in a decaying stump, tree or post from 1 to 50 feet from the ground; depth 3 to 12 in.; lined with moss, plant-down, feathers, hair, wool or other warm materials. *Eggs:*

[1] Beal, McAtee and Kalmbach: United States Department of Agriculture, Farmers' Bulletin No. 755, 1916, pp. 29–31.

Photograph by Harry G. Higbee

FIG. 92. — NEST OF CHICKADEE, OPENED TO SHOW EGGS

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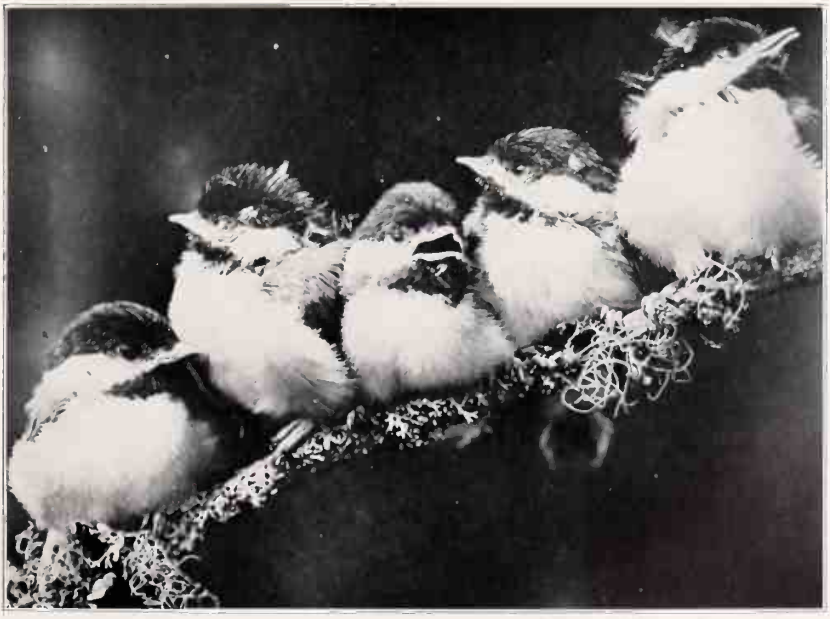

Photograph by Miss Cordelia J. Stanwood

FIG. 93. — CHICKADEES IN JUVENILE PLUMAGE

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5 to 10, commonly 6 to 8, rarely 13; .52 to .65 by .45 to .48 in.; usually rounded ovate; white, spotted and speckled with reddish-brown or finely marked with a paler shade; figured by E. A. Capen in "Oölogy of New England," Plate II, Figs. 4, 5. *Dates:* May 10 to June 4, Connecticut; May 4 to June 25, Massachusetts; May 10 to June 18, Maine. *Incubation:* Period 11 to 13 days; by both sexes. One or two broods yearly.

Range. — Northeastern United States and southeastern Canada. Breeds in Canadian and Transition zones from northern Ontario, central Quebec, southern Labrador and Newfoundland south to central-eastern Missouri, central Illinois, northern Indiana, southern Ohio, Pennsylvania, northern New Jersey and in the Alleghanies south to southwestern North Carolina; winters over most of its range, except perhaps extreme northern part, and somewhat farther south to Kentucky, southern Illinois and northern Virginia.

Distribution in New England. — Common permanent resident throughout the region; in New Hampshire breeding below 3,000 feet; most numerous (or at least most noticeable) in autumn and in winter.

Season in Massachusetts. Permanent resident.

Haunts and Habits. The little Black-capped Chickadee is the embodiment of cheerfulness, verve and courage. It can boast no elegant plumes, and it makes no claims as a songster, yet this blithe woodland sprite is a distinctive character, and is a bird masterpiece beyond all praise. It is spruce and smart in its plain black, gray and white livery; and its cheery, cordial notes are the "open sesame" to woodland secrets. Follow the call of a Chickadee and it will introduce you to its brethren and to a sociable gathering of kinglets, nuthatches, a Downy Woodpecker or two, and possibly a creeper. In the proper seasons migrating warblers may also join the group. A born leader is this little "scrap of valor." The other birds seem to know that Chickadee's superior intelligence and prying eyes will guide them to places where insect food is most abundant.

Let the north winds howl, let the snowstorm rage — it may be bitter cold, but Chickadee worries not as he hustles about to keep his little stomach filled with insects. Only the ice storm which envelops the trees and conceals the insects beneath its crystal cloak is likely to have an intimidating effect on Chickadee's otherwise deep-rooted self-confidence. Then it will come to human friends for food and care, or else hie away to some snug refuge in a hollow limb or deserted bird's nest, there to abide till the storm has run its course.

At this season Chickadees are the prevailing birds, and one usually finds them roving the woods in small bands. Move quietly now; imitate their "*phe-be*" call, or suck in gently on the back of your hand, which will give rise to low, squeaky sounds. This ruse will not fail to attract our little friends, for they are innately inquisitive. Soon they flit and flutter about the twigs right over your head, come close at arm's length and peer down at you with their keen bead-like eyes and scold you or mock you with a voluble chattering of *chic-chic-a-dee-dee*. If you are patient and still, perhaps one or more of these bold birds will want to satisfy its curiosity by alighting on some part of you, when you will experience "the thrill of a lifetime." Dr. Frank M. Chapman writes of such encounters — "On several occasions Chickadees have flown down and perched upon my hand. During the few seconds they remained there I became rigid with the emotion of this novel

experience. It was a mark of confidence which seemed to initiate me into the ranks of woodland dwellers." [1]

When the blustering winds of March have followed the passing of winter, Chickadee acquires new notes, high pitched, sweet and plaintive, consisting of two or three notes which sound like *phe-be* or *phe-be-be*, or, as it has been translated, "*Spring's come.*" The first note is protracted and the others fall one or two tones lower. Mrs. J. E. Carth of Wellesley, writing to Mr. Forbush in a letter dated March 21, 1921, says that she heard a Chickadee whistle the *phe-be* notes almost ninety times in about two minutes. Certainly this bird was infused with a rare spring rapture. Besides the notes from which the bird derives its name, the Chickadee occasionally expresses itself with a peculiar lisping and gurgling that has a slightly musical quality. This may represent its love song, but I have heard it given at other seasons and even in mid-winter.

As April approaches the roving flocks disperse and the birds separate into scattered pairs. Then they become more shy and retire to secluded spots in the woods to nest. The Chickadee's courtship is a simple affair. Sometimes a little coquette will divide her attention between two ardent admirers until they become fairly furious and fly at each other with malicious intent.

Occasionally a deserted woodpecker's home is appropriated, but normally the birds elect to excavate their own chamber in the decaying punky stump of a birch or pine. In such cases they often take advantage of the pit made by some woodpecker in its efforts to get at a grub. Soon the pit is enlarged to a sizable cavity and furnished to accommodate a whole family of five to ten future Chickadees. Unlike the Downy Woodpecker who flirts the chips out upon the ground beneath its hole, the Chickadee invariably carries the tell-tale chips to a safe distance to be dropped. The bird is not known to penetrate sound wood.

The male Chickadee is a devoted father, assisting his mate in all the tasks of home-building, incubation and the raising of their offspring; and the birds exhibit a tender affection and constant solicitude for the care of their eggs and young.

During incubation the Chickadee tries to frighten away prying eyes with an amusing trick which John Burroughs tells about in "Far and Near" (1904, pp. 137, 138): "One day a lot of Vassar girls came to visit me, and I led them out to the little sassafras to see the Chickadees' nest. The sitting bird kept her place as head after head, with its nodding plumes and millinery, appeared above the opening of her chamber, and a pair of inquisitive eyes peered down upon her. But I saw that she was getting ready to play her little trick to frighten them away. Presently I heard a faint explosion at the bottom of the cavity, when the peeping girl jerked her head quickly back, with the exclamation 'Why, it spit at me!' The trick of the bird on such occasions is apparently to draw in its breath till its form perceptibly swells, and then give forth a quick, explosive sound like an escaping jet of steam. One involuntarily closes his eyes and jerks back his head." The young birds in the nest have a peculiar faint imitation of the ordinary call, and their combined vocal efforts have been likened to the hissing of some huge snake.

[1] Handbook of Birds of Eastern North America, 1914, p. 487.

The first few days after the young Chickadees have left the nest are ones of anxiety and great exertion for the old birds. So many children require an enormous amount of food, and constant care must be taken lest they fall into the clutches of marauding hawks, owls, crows or the destructive house-cat. They are handsome, fluffy little bunches of black, gray and white feathers, and already display the tempered dispositions of their parents. By the end of August the fledglings have attained strength and wisdom, and are able to shift for themselves. A month later the family begins to wander, and perhaps to unite with another friendly family. Having no predilection as to locality, they will come to your very yard to glean a meal, as well as roam the woodlands in their untiring quest of insects and insect eggs.

The Chickadee deserves all the praise and popularity that is his, for, besides being a perfect model of optimism, industry and courage, there is convincing proof that this bird is one of the most valuable of our orchard, woodland or forest birds. Throughout the year Chickadee wages warfare on infinite hosts of insect pests, and in effectively reducing their numbers renders invaluable services to agriculture and forestry. This versatile bird has learned to procure its sustenance from trunk and bough, from tree-top and ground, and every crack and cranny in which insects hibernate or lay their eggs. No bug is too small to escape its penetrating eyes, and no caterpillar too large for Chickadee to tackle. It is as much an acrobat as any nuthatch and is a skillful flycatcher as well, catching insects on the wing with remarkable facility.

The devices and expedients which this clever little bird uses in securing its food are innumerable. In "Useful Birds and Their Protection" Mr. Forbush gives an interesting illustration of one of Chickadee's methods: "I once saw a Chickadee attempting to hold a monster caterpillar, which proved too strong for it. The great worm writhed out of the confining grasp and fell to the ground, but the little bird followed, caught it, whipped it over a twig, and, swinging underneath, caught each end of the caterpillar with a foot, and so held it fast over the twig by superior weight, and proceeded, while hanging back downward, to dissect its prey. This is one of the most skillful acrobatic feats that a bird can perform, — although I have seen a Chickadee drop over backward from a branch, in pursuit of an insect, catch it, and, turning an almost complete somersault in the air, strike right side up again on the leaning trunk of the tree." [1]

Chickadee's intelligence is further exemplified in its resourceful habit of carrying off and apparently concealing for future use, seeds and other bits of food, which it commonly wedges into convenient crevices in the bark of trees, in posts, or even about one's house.

During cold weather the little Black-capped Chickadee may easily be attracted to any farmyard or orchard, and sometimes to suburban dwellings. By hanging up here and there among the trees, scraps of suet, pork rind or bacon, and maintaining some sort of feeding shelf amply supplied with sunflower seeds and split squash or pumpkin seeds (of which it is very fond), shelled nuts and meats, the Chickadees and other birds will come day after day to feast on the provided food, while their almost ceaseless activity

[1] Useful Birds and Their Protection, 1907, p. 165.

keeps them gleaning the insects from the surrounding trees; thus such favored localities are apt to be freed from the ravages of insect pests. If the Chickadee has become habituated to a certain place during the winter, it may be induced sometimes to stay and breed in a suitable nesting box if conditions are favorable. Not infrequently this friendly little bird becomes domesticated in this way, and it proves to be a great asset to the person who encourages it to live about his dwelling.

Notwithstanding Chickadee's diminutive size, its eating capacity is enormous, for such constant activity as characterizes this bird occasions rapid digestion and assimilation of food. In an examination of the stomach contents of 289 Chickadees, Professor F. E. L. Beal found that its food is 68 per cent animal and 32 per cent vegetable matter.[1]

Prominent among the insect components are the eggs, larvæ and pupæ of such destructive moths as the tent-caterpillar, canker-worm, brown-tailed, gipsy and codling moths. In winter the Chickadee consumes large quantities of the eggs of plant-lice, which are fastened to the twigs of trees. Investigation of the stomach contents of a single Chickadee disclosed the fact that it had eaten more than 450 eggs of this injurious insect in one day.[2] Other aphids are favorite foods of this bird in spring and summer. Several forms of scale-insects, spiders and their eggs, bark-beetles, weevils and many minute injurious insects are eaten by the Chickadee. In winter more than half of its diet consists of insect food, while a fair measure of various other food is taken, such as the seeds of birches, small quantities of oats and waste grains picked up from the roadsides, the seeds of spruce and hemlock, and the berries of sumacs, bayberry and poison ivy. Sometimes the Chickadee gets nourishment by picking at frozen apples left on trees. But during the warmer seasons when there is a plentitude of all kinds of insect life, the Chickadee's feeding is restricted almost entirely to animal matter. Then it will take beetles, flies, wasps, ants and sometimes grasshoppers. Professor E. Dwight Sanderson has estimated that in Michigan Chickadees destroy 8,000,000,000 insects annually.[3]

[Author's Note: The Chickadee is a very irregular migrant. When winter comes Chickadees wander more or less from their breeding places in search of food. In some years these movements may be merely from woodland to orchard or village. In other years extended migrations occur when Chickadees are abundant in some regions and scarce in others. This seems to be true throughout the northern part of their range, and the irregular larger movements seem to be southward. These migrations are most noticeable in the northern part of their range. Major Mark Robinson, who was at the time stationed at the Algonquin National Park in the great northern wilderness of Ontario, wrote to me on December 1, 1923, that Chickadees there had decreased in numbers and that it was very evident that a big southward migration had taken place.

Mr. W. E. Saunders, writing from London, Ontario, in December, 1919, tells something of his experience at Point Pelee on the north shore of Lake Erie, one of the points from which vast numbers of birds migrating southward launch out to cross the lake. He says:

"I have found that no other species of insectivorous bird is so wedded to its own locality as the Chickadee. It nests within three or four miles of our city, and yet there are years when we see absolutely none of them in town, though they may be found in the woods. At Point Pelee, where the exhibition of migra-

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 630, 1926, p. 511.

[2] Weed, Clarence M., and Dearborn, Ned: Birds in Their Relation to Man, 1903, p. 107. [3] Auk, Vol. XV, 1898, p. 153

tion is magnified on account of concentration, there have been winters when we have not seen a Chickadee, which is to me absolute proof that no migration took place. Another year they may come down in swarms, and when we see them at Point Pelee we see them also in London. Probably there is no great movement of Chickadees except when there is a scarcity of food in their usual haunts."

I can add to the vegetal part of the winter food of the Chickadee as given above by Mr. Broun, seeds of the white pine, goldenrod and wild carrot and the fruit of the Virginia juniper or red cedar. Mr. Aretas A. Saunders informs me that he has watched Chickadees eat seeds of the tulip tree. Also he says that when Chickadees were seen apparently eating sumac berries or poison ivy berries that he found by close observation that they were not eating the berries but were picking off scale insects between the berries on the twigs. Evidently Chickadees prefer animal to vegetal food at all seasons when they can get it, but we have the best of evidence that they eat berries also, as remains of these berries have been found frequently in the birds' stomachs.

In winter Chickadees become almost omnivorous. They peck fat and flesh from carcasses of animals left hanging or lying in the woods by trappers. They can eat and digest weed seeds at a pinch, but even in winter, according to Professor Clarence M. Weed, more than half of their food consists of insects, including a large proportion of insects' eggs. Among the insect pests taken in winter are curculios, bark-beetles, the larvæ of codling-moths, bugs, flies, leaf-hoppers, moths, geometrid caterpillars, bark-lice and scales, and eggs of canker-worm and tent-caterpillar moths and those of many kinds of plant-lice, among them the apple-tree plant-louse. In summer the bird eats quantities of hairless caterpillars and the hairy caterpillars of the gipsy, brown-tail, tent and forest-tent moths, and it destroys the pupæ and also the larvæ of that recently introduced pest, the satin moth.

In 1894 my small orchard became very seriously infested with canker-worms, tent-caterpillars, codling-moths and gipsy moths. No attempt was made to protect the trees from their enemies until the fall, when, by feeding, numbers of birds were attracted to the orchard. Immense numbers of the eggs of the fall canker-worm moth and the tent-caterpillar moth were already deposited upon the trees, and toward spring large numbers of spring canker-worm moths began to ascend the trees and lay their eggs. So many Chickadees and nuthatches were attracted to the orchard during the winter that they destroyed nearly all the insects and their eggs, and the next season, which proved to be one of great insect multiplication, my orchard was the only one in the neighborhood which produced a good crop of fruit, while most of those in town produced little or no fruit. That part of the orchard of my neighbor across the way which was nearest to mine retained most of its foliage and set a fair crop of fruit, showing how his orchard had been benefited by its nearness to my own. My assistant, Mr. C. E. Bailey, who watched the feeding of the birds and dissected the stomachs of some of them, estimated that one Chickadee would destroy 138,750 eggs of the canker-worm moth in the twenty-five days during which the female moths lay their eggs. E. H. F.]

Economic Status. Considering that the Black-capped Chickadee is a prolific species, that it does absolutely no harm as far as we know, and that its food habits entail the destruction of millions of insects, some beneficial, some neutral, but the majority destructive pests of orchard and woodland, the bird's usefulness to mankind is perhaps greater than that of almost any other species.

Penthestes hudsónicus littorális (H. Bryant). Acadian Chickadee.

Other names: Hudsonian Titmouse; Brown-capped Chickadee.

Plate 90.

Description. — Form like that of Black-capped Chickadee. *Adults in breeding plumage (sexes alike)*: Top of head and hind neck grayish-brown (somewhat variable in shade) becoming darker on lores

and about eyes; elsewhere above lighter or hair-brown except wings and tail which are slaty with slate-gray edgings becoming whitish on middle part of longer primaries; sides of head below brown cap whitish on fore part passing gradually into gray on sides of neck; lower jaw, chin and throat black; elsewhere below whitish shading into cinnamon-brown on sides, flanks and under tail-coverts; bill black; iris brown; legs and feet dark plumbeous or bluish-gray. *Adults in winter plumage:* Similar to same in summer but coloration deeper. *Young in first winter plumage:* Virtually as adults but plumage somewhat more lax and sides and flanks slightly duller and paler. *Young in juvenal plumage:* Similar to first winter plumage but darker and chin and throat not so black.

Measurements. — Length 5.50 to 5.55 in.; spread 8.50 to 9.00; wing 2.50 to 2.75; tail 2.25 to 2.50; bill .37 to .39; tarsus .50 to .55. Female smaller than male.

Molts. — Similar to those of Chickadee (see page 368).

Field Marks. — Size and shape about that of Black-capped Chickadee, smaller than Chipping Sparrow; a typical chickadee but brown above with a grayish-brown cap, smaller black patch on chin and throat and more reddish on sides; behaves like Black-capped Chickadee but is not quite so lively; resembles closely Hudsonian Chickadee but is slightly smaller and browner.

Voice. — Calls, somewhat resembling those of Black-capped Chickadee, but harsher, also "low chattering conversational sounds" (Wm. Brewster); a low *chip*, an abrupt, explosive *tch-tchip*, and a nasal drawling *tchick, chee-day-day* (F. M. Chapman); pronounced intervals before and after the double middle note distinguish it from any utterance of the common Chickadee; *tswee-chee y-a-a-ck*, emphasis on last syllable and with rising inflection (Sanford Ritchie); is said to have also a "sweet warbling song."

Breeding. — In northern cone-bearing woods of cedar, balsam fir, spruce, etc., often in wooded swamps and bogs. *Nest:* In decaying stub or tree, in natural cavity or one excavated by the birds; usually rather low; made of moss and lichens or fern-down and fur felted together, sometimes lined with feathers and fur. *Eggs:* 6 or 7; about .55 by .45 in.; similar to those of Chickadee (see page 369); figured by E. A. Capen in "Oölogy of New England," Plate II, Figs. 6, 7. *Dates:* May to early July, southern Ontario. *Incubation:* No details.

Range. — Northeastern United States and southeastern Canada. Breeds in Hudsonian and Canadian zones, from southern Quebec, southern Labrador and Newfoundland south to central New York, southern Vermont, central New Hampshire, southeastern Maine, southern New Brunswick and southern Nova Scotia; winters throughout its breeding range and south casually to southeastern New York, northern New Jersey, southern Connecticut and Rhode Island.

Distribution in New England. — *Maine:* Uncommon to rare resident in northern and eastern parts, elsewhere uncommon to rare winter visitor. *New Hampshire:* Uncommon to rare resident from White Mountains north chiefly above 3,000 feet, elsewhere rare winter visitor. *Vermont:* Uncommon to rare resident in extreme northern part and on higher mountains, elsewhere rare winter visitor. *Massachusetts, Rhode Island and Connecticut:* Rare and irregular late fall and winter visitor.

Season in Massachusetts. — October 18 to April 5 (June 5).

Haunts and Habits. The Acadian Chickadee seems to prefer cone-bearing trees to the broad-leafed hardwoods and in my experience, the little bird seems loath to leave the coniferous woods. I have never seen it far from its natal spruces, firs, cedars or pines. Otherwise in its habits it closely resembles our common Black-capped Chickadee though its color is quite different and the black cap is replaced by grayish-brown. It seems perfectly at home in cedar swamps and apparently prefers moist lands and shady sheltered woods the year round. Its habits and behavior are very similar to those of the Black-capped Chickadee. It is just as acrobatic and as cheerful in the face of the severest weather.

The bird is an irregular and rare straggler into southern New England. There are many years in which it is not recorded at all but occasionally a few appear here and there.

The food of this species consists largely of caterpillars, moths and beetles and the eggs and hibernating forms of many small insects, among them many of the greatest enemies of coniferous trees. Little is known of the exact character of its food, but the food of all our northern titmice is of the same general character, and only varies according to the kinds of trees that they frequent, and also in accordance with the climatic character of their range.

Economic Status. See page 364.

Penthestes hudsonicus nigricans C. W. Townsend. **Labrador Chickadee.**

Note. In 1916 Dr. Charles W. Townsend described under the above name a race of the Hudsonian Chickadee from the forested region of Canadian Labrador.[1]

This race has not been recognized (1929) by the American Ornithologists' Union. In size it seems to range between the Hudsonian Chickadee and the Acadian Chickadee. The type is darker in color on the back than either, being dusky-grayish there; and its sides and flanks are not so reddish as those of the Acadian Chickadee. Experts who are acquainted with these brown-capped titmice claim to be able to distinguish these different races in the field by both color and notes. The voice of the Labrador bird is said to be weaker than that of the Acadian, which is said also to be much less suspicious than the other. The Labrador Chickadee evidently migrates occasionally over New England. Messrs. William Brewster and Walter Faxon each took a brown-capped chickadee on Mount Greylock in Berkshire County, Massachusetts, in 1889 and saw others. The birds taken by them have been referred since to the new race.[2] In 1916 there was a considerable migration of this race into New England and a few reached the northern half of New Jersey.[3]

Family **SYLVIIDÆ.** Warblers, Kinglets, Gnatcatchers.

Number of species in North America 6; in Massachusetts 3.

This is a large family composed principally of Old World birds, represented in America chiefly by our kinglets and gnatcatchers. They are rather closely related to the thrushes, but their young, unlike those of the thrushes, are unspotted. They have 10 primaries, the first spurious (the American wood warblers have but nine). All the North American members of the family are characterized by their diminutive size.

Economic Status. Birds of this family are not only harmless but, being chiefly insectivorous, are decidedly beneficial.

Subfamily **REGULINÆ.** Kinglets.

Number of species in North America 2; in Massachusetts 2.

This subfamily contains the smallest of North American birds except the hummingbirds. The bill is shorter than the head, straight, rather slender, with nostrils overhung

[1] Auk, Vol. XXXIII, 1916, p. 74. [2] Faxon, Walter, and Hoffmann, Ralph: Auk, Vol. XXXIX, 1922, pp. 66, 67.
[3] Wright, Horace W.: Auk, Vol. XXXIV, 1917, pp. 164–170.

by tiny feathers; the wing is pointed and is longer than the tail, the exposed part of the first (spurious) primary is less than half as long as the second; the tarsus is booted and the side toes are of nearly equal length.

Régulus sátrapa satrapa Lichtenstein. Golden-crowned Kinglet.

Other names: GOLDEN-CRESTED WREN; GOLD-CREST.

Plate 91.

Description. — Smallest New England bird, excepting Ruby-throated Hummingbird; plumage long, soft and lax. *Adult male in breeding plumage:* A bright patch of orange or reddish-orange extending up center of crown, bordered by bright yellow and all enclosed by a wide V-shaped stripe of black, extending around forehead and back to nape; fore part of forehead connecting with wide stripe over eye white or grayish-white; sides of head whitish, except a dusky streak through eye and another along lower jaw; hind neck and extreme upper back mouse-gray, rest of back grayish-olive shading into greenish-olive on rump and upper tail-coverts; wings and tail dusky with light yellowish-olive feather-edgings; middle and greater wing-coverts tipped with pale yellowish or yellowish-white; below olive-whitish, sides and flanks faintly tinged with yellowish-olive; bill blackish; iris brown; "tarsi yellowish-brown, feet and claws yellow (light ochre)" (Allan Brooks). *Adult male in winter plumage:* Similar to same in spring but more brightly colored and more buffy below. *Adult female:* Similar to adult male but orange in crown replaced by yellow. *Young in first winter plumage:* As adults. *Young in juvenal plumage:* Above chiefly olive-brown, slightly more greenish on back, top of head grayish-brown or grayish-olive without crown-patch, margined on sides with a rather indistinct black line; otherwise nearly as adults but back at first mottled with dusky feather-edges; plumage very loose.

Measurements. — Length 3.15 to 4.20 in.; spread 6.50 to 7.00; folded wing 2.00 to 2.25; tail 1.60 to 2.00; bill .32 to .37; tarsus .60 to .70. Female smaller than male.

Molts. — Similar to those of the chickadees, though in the postjuvenal molt, that of the wing-coverts involves chiefly the lesser coverts (see page 368).

Field Marks. — A tiny olive-green and gray bird, smaller than any American wood warbler; lives largely among the twigs and branches of trees, especially cone-bearing trees with thick foliage; shows two light wing-bars and *a white stripe over eye* bordered above by a black stripe; a yellow or yellow and orange crown-patch bordered with black, but usually when the bird is in the tree the bright crown cannot be seen from below; has a habit of flipping out the tips of its wings above its back frequently.

Voice. — "A shrill, characteristic song sounding much like '*tsee, tsee, tsee, tsee, tsee, ti, ti, ti, ti, ti, ti, ti, ti, ti,*'" (O. W. Knight); "the notes which it utters while it sojourns with us are squeaky, resembling those of the Brown Creeper" (A. T. Wayne); "song, dainty, ascending *ti-zee, ti-zee, ti-zee, tit-tit-tit,* sibilant and falling rapidly at the end; or *tzee-tzee-tzee-tzee, ti, ti, ter, ti-ti-ti-ti,* rising at first with fine, high-pitched, somewhat faltering notes, and then falling away into a short, rapid, rather explosive warble; occasionally, a thin, rapidly-uttered *teet-ee-tee;* call most commonly heard, a fine high, penetrating *ti-ti,* barely distinguishable even to practiced ears; very thin, sweet, warbler-like call-notes, sometimes uttered with variations to make a song; (1) a sibilant *tsee-tsee-tsee-tseet;* (2) *tseer, tseer, tseer;* (3) *tit-tit-tit-tit-tit-tit-tit;* (4) a high *te-deck-deck,* or *ti-deck, ti-deck;* (5) a hard little *paeu*" (G. F. Simmons).

Breeding. — Chiefly in northern coniferous woods or forests. *Nest:* In coniferous tree from 4 to 50 feet up; globular with a small opening at the top, usually suspended or partly pensile from twigs, sometimes on or against a limb, concealed by foliage; composed of green mosses, usnea and other lichens, soft fine strips of bark, bits of leaves, rootlets, etc., and lined with feathers. *Eggs:* 8 to 10; .47 to .57 by .39 to .45 in.; usually ovate but variable in shape; creamy-white, dirty white or cream-color with many fine markings of pale wood-brown and a few larger spots and blotches of lavender; figured by E. A. Capen

PLATE 91

PLATE 91

RUBY-CROWNED KINGLET
Page 380

MALE

FEMALE

GOLDEN-CROWNED KINGLET
Page 376

MALE

FEMALE

BLUE-GRAY GNATCATCHER
Page 383

MALE

FEMALE

Allan Brooks

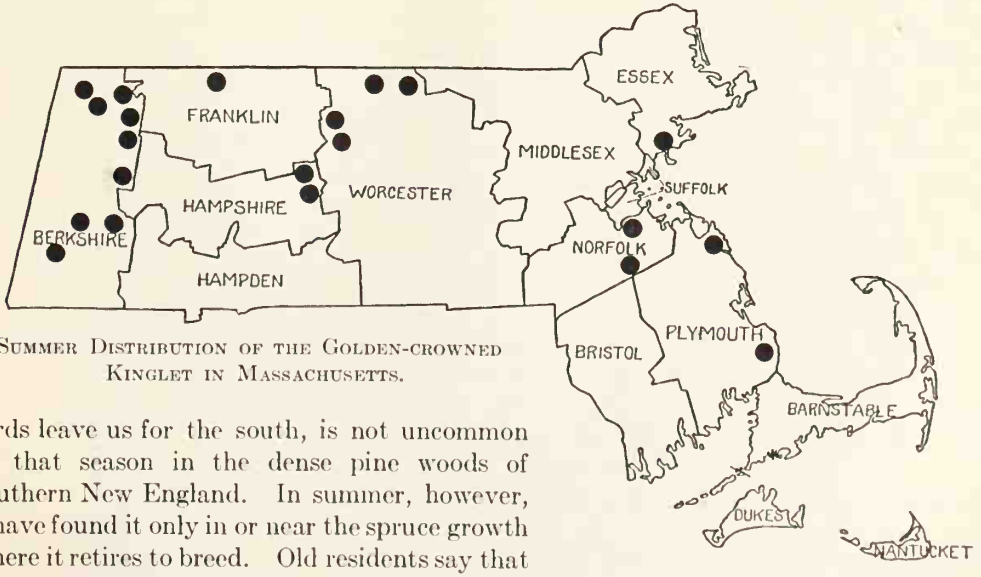
in "Oölogy of New England," Plate II, Figs. 1, 2. *Dates:* May to June 29, Massachusetts; late May to June 24, Maine; June 15, Labrador. *Incubation:* Period, no definite details, but probably about the same as that of the English Golden-crested Wren which is 12 to 13 days (H. F. Witherby); apparently by female. One brood yearly, possibly sometimes two.

Range. — Eastern and central North America (except extreme northern part) to northern Mexico. Breeds in Canadian and Hudsonian zones from central Manitoba, southern Ungava (central Quebec) and central Labrador south to northern Minnesota, northern Michigan, southeastern Ontario, New York, southeastern Massachusetts and in the higher Alleghanies south to southwestern North Carolina; west in migration to Nebraska; winters from southern Minnesota, southern Wisconsin, southern Michigan, southwestern Quebec, southeastern Ontario, southern New Brunswick and Nova Scotia to Tamaulipas (northeastern Mexico), southern Texas, southern Louisiana, southern Alabama and northern Florida.

Distribution in New England. — *Maine:* Common migrant; less common winter resident; common summer resident in northern parts becoming less common southward. *New Hampshire:* Common migrant; less common winter resident; common summer resident from White Mountains north, but local to the southward. *Vermont:* Common migrant; much less common winter resident; occasional local summer resident. *Massachusetts:* Common migrant; less common winter resident; uncommon to very rare summer resident in western counties and very rare or local in summer in eastern parts. *Rhode Island and Connecticut:* Common migrant and winter resident.

Season in Massachusetts. — September to April (summer).

Haunts and Habits. This tiny dainty birdlet whose long soft plumage and remarkable vigor enable it to withstand the rigors of a New England winter when much larger



Summer Distribution of the Golden-crowned Kinglet in Massachusetts.

birds leave us for the south, is not uncommon at that season in the dense pine woods of southern New England. In summer, however, I have found it only in or near the spruce growth where it retires to breed. Old residents say that it has disappeared since the spruce and pine were cut from a large part of the region in western Massachusetts where it formerly bred. It is to be found occasionally, however, where spruce still grows. In migration it may be found almost anywhere where trees grow or even in bushes and thickets, in orchards or in sproutlands, but in summer or

winter it prefers the cone-bearing trees. If seen in winter its little nervous trick of flirting up the wing-tips, like a flash, will identify it at once, as then it is the only bird that habitually does this except the Ruby-crowned Kinglet and the latter is almost accidental in winter in New England. It feeds much near the ends of the limbs among the small twigs and during the warmer part of the year it often flutters there in the air like a hummingbird before a flower.

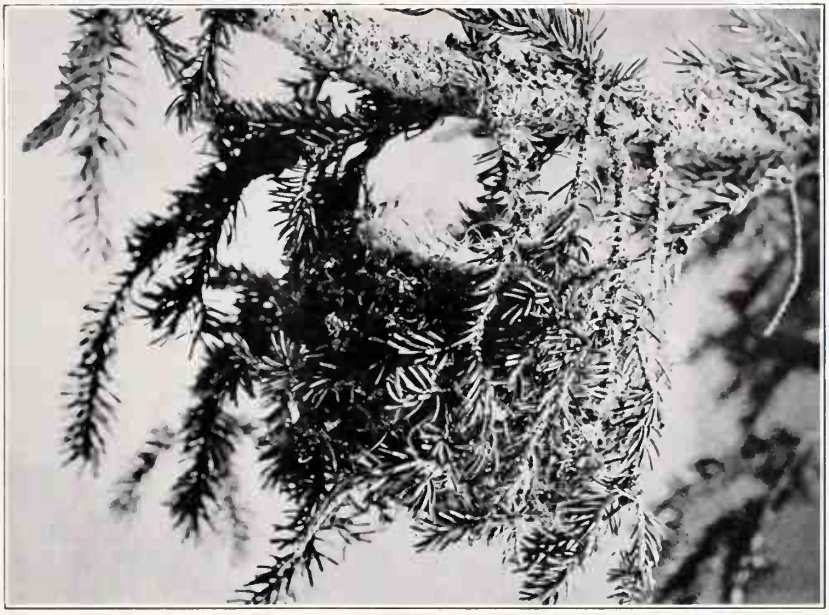
Usually the orange central part of the crown of the male is concealed by the yellow feathers, so that a male is easily mistaken at times for a female, but whenever he becomes in the least excited the orange blazes forth. On the breeding grounds this bird might be overlooked among the dark evergreen trees were it not for the song of the male which, in nest-building time, will lead the observer to his consort. The female does most of the nest-building while the male stays with her and encourages her with song. It is useless to attempt to find a nest except when the female is building or later when the parents are carrying food for the young. When a nest is found no one should go near the tree until a week or two after building is finished, as any near approach to the nest before the eggs are laid probably will cause the birds to abandon it.

The young ones having donned their winter dress and learned to care for themselves, as autumn wanes the kinglets work their way southward in little companies though a few remain all winter, wandering through the winter woods where food is plentiful, often in company with chickadees, nuthatches and other winter wood-birds, but not infrequently by themselves. Although I have watched these birdlings many times at dusk, I never could tell where they slept throughout the long winter nights except that they gathered in dense pine woods. It is probable that these tiny things find some old deserted squirrels' nest or some hollow tree as a shelter in which to pass the cold windy nights of winter. Although their plumage is long, thick and fluffy for so small a bird, doubtless a bleak exposure at night would be more than they could bear. European Goldcrests when caged are found to be tender and even in the protection of a building a sudden drop in temperature is said to be fatal. Probably kinglets, like nuthatches, chickadees and the smaller woodpeckers, are obliged to find snug quarters on cold nights.

Kinglets in summer feed chiefly on small flying insects, many of which they catch on the wing. In winter they feed largely on scale-insects and the eggs of plant-lice and other small tree pests. Among the insects eaten are small grasshoppers and locusts, weevils, leaf-hoppers, plant-lice and caterpillars.

No thorough study of the food of this bird has been made but I had an experience with it which convinced me that the bird could be very useful and will quote my own statement here in full:

"Kinglets are particularly serviceable in woodlands, especially among the coniferous trees in which they dwell. At Wareham, on December 25, 1905, I watched the Gold-crest hunting its insect food amid the pines. The birds were fluttering about among the trees. Each one would hover for a moment before a tuft of pine 'needles,' and then either alight



Photograph by Miss Cordelia J. Stanwood

FIG. 94. — NEST OF GOLDEN-CROWNED KINGLET

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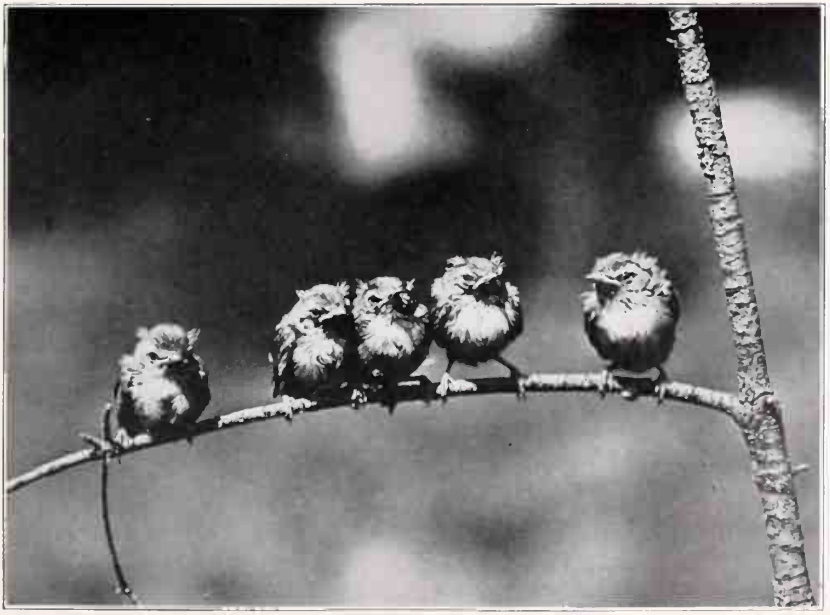

Photograph by Miss Cordelia J. Stanwood

FIG. 95. — YOUNG OF GOLDEN-CROWNED KINGLET

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upon it and feed, or pass on to another. I examined the 'needles' after the Kinglets had left them, and could find nothing on them; but when a bird was disturbed before it had finished feeding, the spray from which it had been driven was invariably found to be infested with numerous black specks, the eggs of plant-lice. Evidently the birds were cleaning each spray thoroughly, as far as they went.

"Since the above was written several of these infested sprays have been sent to Professor F. E. L. Beal of the Biological Survey, who submitted them to Mr. Pergande of the Bureau of Entomology, who says that they are the eggs of a plant-louse of the genus *Lachnus*, and in all probability *Lachnus strobi*, the white pine louse. The pines are considerably infested, and several pairs of Kinglets have been seen feeding upon the eggs.

"Again since the above was written I have had occasion to observe the work of Kinglets in our home grove of white pine. For the past two years certain plant-lice or bark-lice that infest these trees have been increasing so rapidly in the grove as to menace the trees; but on December 29, 1905, seven Kinglets were seen feeding there. As it was unusual to see so many there, they were carefully watched. They were not working upon the foliage, as in the case mentioned above, but mainly on the trunks and larger branches. They were very unsuspicious, and it was easy to see that they were feeding upon the eggs of the aphids. Some of these eggs were sent to Dr. L. O. Howard, who gave it as his opinion that they belonged to some species of *Lachnus*. These eggs were deposited in masses on the bark of the pines from a point near the ground up to a height of thirty-five feet. The trees must have been infested with countless thousands of these eggs, for the band of Kinglets remained there until March 25, almost three months later, apparently feeding most of the time on these eggs. When they had cleared the branches the little birds fluttered about the trunks, hanging poised on busy wing, like Hummingbirds before a flower, meanwhile rapidly pecking the clinging eggs from the bark. In those three months they must have suppressed hosts of little tree pests, for I have never seen birds more industrious and assiduous in their attentions to the trees. One might expect such work of Creepers or of Woodpeckers; but the Kinglets seemed to have departed from their usual habits of gleaning among limbs and foliage, to take the place of the missing Creepers, not one of which was seen in the grove last winter." [1]

Economic Status. Professor W. B. Barrows says of the Golden-crowned Kinglet: "The food of this bird consists almost entirely of insects and their eggs, and it cannot be doubted that it is decidedly beneficial to the farmer and fruit grower. It is often seen eating plant-lice and is a common bird in the orchards during migration, on such occasions spending much time about the opening buds and among the terminal twigs where it collects large quantities of harmful insects." [2]

[1] Forbush, Edward Howe: Useful Birds and Their Protection, 1907, pp. 161–163.
[2] Michigan Bird Life, 1912, p. 703.

Regulus caléndula calendula (Linnæus). Ruby-crowned Kinglet.

Other names: RUBY-CROWNED WREN; RUBY-CRESTED WREN; RUBY-CROWN.

Plate 91.

Description. — Form like Golden-crowned Kinglet; eyes large. *Adult male in breeding plumage:* A large fan-shaped concealed patch of vermilion on top of head; elsewhere above grayish-olive-green becoming brighter on rump, upper tail-coverts and edges of flight-feathers and tail-feathers which are chiefly dusky; two pale wing-bars; eye-ring and outer edges of inner tertials white, or whitish; sides of head chiefly grayish passing into pale grayish-buffy below on chin, throat and upper breast, becoming more yellowish on flanks; olive-whitish on belly and under tail-coverts; iris brown; "bill black; tarsi dark olive, feet brownish-yellow" (Allan Brooks). *Adult male in winter plumage:* Similar but brighter; more olivaceous above and brighter below. *Adult female:* Similar to adult male, but without red crown-patch; somewhat browner in autumn. *Young in first winter plumage:* As adults of their respective sexes or practically indistinguishable, the young male having the red crown-patch but not always as bright as in the adult. *Young in juvenal plumage:* Browner than adults; no red crown-patch; similar to juvenal young of Golden-crowned Kinglet (see page 376), but darker and without the dark lines on crown or the whitish stripe over the eye; "bill and feet dusky-pinkish-buff, nearly black later" (J. Dwight).

Measurements. — Length 3.75 to 4.60 in.; spread 6.66 to 7.50; folded wing 2.17 to 2.35; tail 1.65 to 1.90; bill .32 to .38; tarsus .70 to .76. Female smaller than male.

Molts. — Similar to those of the chickadees but "a few new feathers often appear in the spring, indicating a tendency toward prenuptial molt" (J. Dwight).

Field Marks. — Larger than Golden-crowned Kinglet but smaller than smallest warbler; has nervous manner of the former and similar flirting of wing-tips; may be distinguished from it at once by absence of light and dark stripes on head and of *yellow crown patch; conspicuous white eye-ring enclosing black eyelid and large dark eye* give the bird a startled staring expression unlike that of any other bird near its size; plain greenish-olive fading to whitish below; two pale wing-bars; *the red patch usually concealed.*

Voice. — Calls, a wren-like *cack* or *tzchek*, a slender wiry *tsip*, a wren-like chatter and a harsh "grating" note. Song, "a low but penetrating warble, beginning with a slow, regular, and rather high-pitched *see-see-see-see*, breaking suddenly into a much lower-scaled *tieu-tieu-tieu-tieu*, somewhat merged in an intricate warbling, and suddenly brought to a close by several high-pitched *te* notes, the whole song given as *see, see, see, see, tieu-tieu-tieu-tieu-te-te-te;* all in all, a sweet, helter-skelter, flute-like little melody, full of soft mellow liquid warblings, incredibly loud for so small a bird, and heard for several hundred yards" (G. F. Simmons); song "begins with a few clear whistles, followed by a short, very sweet, and complicated warble, and ending with notes like the syllables *tú-we-we, tú-we-we, tú-we-we*" (H. D. Minot).

Breeding. — In northern cone-bearing forests. *Nest:* In coniferous tree, usually a spruce, from 2 to 50 feet up; sometimes almost pensile and sometimes saddled on a limb, well concealed by dense foliage; composed chiefly of mosses and lichens and lined with *usnea* mixed with feathers and moss or hair. *Eggs:* 5 to 10, usually 8; .54 to .55 by .42 to .45; creamy-white to white with usually some fine dotting of reddish-brown chiefly at large end, this sometimes so faint that egg appears pure white. *Dates:* June 1, Nova Scotia; June 11, British Columbia; June 1 to 30, Colorado. *Incubation:* No details. One brood yearly, probably sometimes two.

Range. — North and Central America. Breeds in Canadian and Hudsonian zones north to tree limit from northwestern Alaska, central Yukon, central Mackenzie, northern Manitoba, northern Ontario, central-western Ungava (Quebec) and central Labrador south to south-central Alaska, Washington, northern Montana, central Saskatchewan, central Manitoba, northern Michigan, south-central Ontario, southwestern Quebec, northern Maine, southern New Brunswick and Nova Scotia; winters from southern British Columbia, southern Iowa, northern Illinois, southern Indiana, northern New Jersey, southeastern New York and Massachusetts (casually) south to southern Lower California, southern Texas,

southern Alabama, southern Florida and through Mexico to Guatemala; accidental in Greenland and Scotland.

Distribution in New England. — *Maine:* Common migrant; rare summer resident chiefly in northern parts, accidental in winter. *New Hampshire and Vermont:* Common migrant. *Massachusetts and Connecticut:* Common migrant; casual in winter and very rarely resident throughout some mild winters. *Rhode Island:* Common migrant. Winter Records: *Maine:* Orono, bird seen on the campus of the University of Maine, January 7, 1923, by Mrs. Warner J. Morse. *Massachusetts:* Sheffield, March 3, 1921, Hamilton Gibson reports one remaining all winter in shrubbery near school grounds. *Connecticut:* Fairfield, one bird passed the winter of 1923–24 at Birdcraft Sanctuary, still there on March 29, 1924.

Season in Massachusetts. — April 2 to May 18 (May 27); September 23 to November 30 (winter).

Haunts and Habits. The Ruby-crowned Kinglet is a lively, nervous little creature, quite as active as a wren. Its behavior, however, much more resembles that of the Golden-crowned Kinglet than that of any wren. Soon after it arrives in spring it becomes conspicuous, announcing its coming by its wonderful song. Dr. Elliott Coues says of it:

"One of the most remarkable things about the Ruby-crown is its extraordinary powers of song. It is really surprising that such a tiny creature should be capable of the strong and sustained notes it utters when in full song. The lower larynx, the sound-producing organ, is not much bigger than a good sized pin's head, and the muscles that move it are almost microscopic shreds of flesh. If the strength of the human voice were in the same proportion to the size of the larynx, we could converse with ease at a distance of a mile or more. The Kinglet's exquisite vocalization defies description; we can only speak, in general terms, of the power, purity and volume of the notes, their faultless modulation and long continuance. Many doubtless have listened to this music without suspecting that the author was the diminutive Ruby-crown, with whose common-place utterance, the slender wiry '*tsip*,' they were already familiar. Such was once the case even with Audubon, who pays a heartfelt tribute to the accomplished little vocalist, and says further — 'When I tell you that its song is fully as sonorous as that of the Canary-bird, and much richer, I do not come up to the truth, for it is not only as powerful and clear, but much more varied and pleasing.'

"This delightful *rôle* is chiefly executed during the mating season, and the brief period of exaltation which precedes it; it is consequently seldom heard in regions where the bird does not rear its young, except when the little performer breaks forth in song on nearing its summer resorts. . . .

"To observe the manners of the Ruby-crown, one need only repair, at the right season, to the nearest thicket, coppice, or piece of shrubbery, such as the Titmice, Yellow-rumps and other warblers love to haunt. These are its favorite resorts, especially in the fall and winter; though sometimes, in the spring more particularly, it seems to be more ambitious, and its slight form may be almost lost among the branchlets of the taller trees, where the equally diminutive *Parula* is most at home. We shall most likely find it not alone, but in straggling troops, which keep up a sort of companionship with each other as well as with different birds, though each individual seems to be absorbed in its particular business. We hear the slender wiry note, and see the little creatures skipping nimbly

about the smaller branches in endlessly varied attitudes, peering in the crevices of the bark for their minute insect food, taking short nervous flights from one bough to another, twitching their wings as they alight, and always too busy to pay attention to what may be going on around them. They appear to be incessantly in motion — I know of no birds more active than these — presenting the very picture of restless, puny energy, making 'much ado about nothing.'" [1]

John Burroughs writes of this species: "How does the Ruby-crowned Kinglet know that he has a brilliant bit of color on his crown which he can uncover at will, and that this has great charms for the female? . . . My ear was attracted by the fine, shrill lisping and piping of a small band of these birds in an apple-tree. . . . There were four or five of them, all more or less excited, and two of them especially so. I think the excitement of the others was only a reflection of that of these two. These were hopping around each other, apparently peering down upon something beneath them. I suspected a cat concealed behind the wall, and so looked over, but there was nothing there. Observing them now more closely, I saw that the two birds were entirely occupied with each other.

"They behaved exactly as if they were comparing crowns, and each extolling his own. Their heads were bent forward, the red crown patch uncovered and showing as a large, brilliant cap, their tails were spread out, and the side feathers below the wings were fluffed out. They did not come to blows, but followed each other about amid the branches, uttering their thin, shrill notes, and displaying their ruby crowns to the utmost. Evidently it was some sort of strife or dispute or rivalry that centered about this brilliant patch." [2]

The favorite haunts of the Ruby-crowns in spring are swampy thickets along the borders of some little streamlet, ditch, brook, pond or meadow. In autumn they are commonly found in low woods or among birches on the hills, usually in small parties, or singly or in pairs with small warblers in the shrubbery along swampy streams. Some authors assert that they sing only in spring, but on warm autumn days they frequently sing a low whisper song and sometimes a carol almost equal to their best vernal efforts. Little seems to be known of their nesting habits though many nests have been found in the great forests of the Rocky Mountains and a few in eastern Canada. Professor O. W. Knight discovered a female building her nest near Bangor, Maine, but she deserted it without laying eggs.

The food of the Ruby-crowned Kinglet in New England has not been investigated. Professor F. E. L. Beal reported on the food of 294 of these birds taken largely in California and found that it consisted of 94 per cent animal matter and 6 per cent vegetal matter — the former principally insects including such pests as leaf-hoppers, plant-lice, mealy-bugs and scale-insects, weevils including bark-beetles, caterpillars, flies and grasshoppers. The vegetal food was seeds of poison oak and leaf-galls with a little wild fruit.[3]

[1] Birds of the Colorado Valley, 1878, pp. 93, 94, 96.
[2] Burroughs, John: Far and Near, 1904, pp. 178, 179.
[3] Beal, F. E. L., and McAtee, W. L.: United States Department of Agriculture, Farmers' Bulletin No. 506, 1912, pp. 34, 35.

Economic Status. Professor Beal considered this species "an important factor in keeping the great flood of insect life within proper limits . . . its small size, . . . just fits it to cope with those minute pests against which man often finds himself so powerless."

Subfamily **POLIOPTILINÆ**. Gnatcatchers.

Number of species in North America 3; in Massachusetts 1.

This is a small group of a single genus and about a dozen species. It is confined to the Americas and chiefly to Central and South America. The bill is shorter than the head, straight, broad and flat at base, tapering to end where notched and tip of upper mandible slightly hooked; the nostrils are uncovered; well developed bristles around mouth; wings rounded, not longer than the rather long graduated tail, its feathers widening toward rounded ends; tarsus scaled and slender; toes very short.

Economic Status. Probably beneficial, as a large part of the insects taken by those species whose food has been investigated are harmful.

Polióptila cærúlea cærulea (Linnæus). **Blue-gray Gnatcatcher.**

Plate 91.

Description. — Wings about as long as rather long graduated tail; first primary short (spurious); legs rather long and slender; feet small. *Adult male:* Above pale bluish-gray, deeper on top of head and hind neck, paler or whitish on rump; upper tail-coverts black; front of forehead and sides of forehead and crown black, forming a conspicuous U-shaped mark; wings slate with pale gray edgings, wider and often whiter on tertials; tail chiefly black, the outer feathers extensively white, the second nearly half white, and the third broadly tipped with white; eye-ring white; sides of head pale bluish-gray becoming paler below on chin and throat; below, mostly white, throat, chest and sides faintly shaded pale bluish-gray; under wing-coverts white; "bill blackish, lower mandible whitish, tip dusky; iris brown; feet blackish" (Allan Brooks). *Adult female:* Similar to adult male but less bluish-gray, sometimes tinged with brownish, and black line bordering crown lacking or very faintly indicated. *Young in first winter plumage:* Similar to adult female but some slight brownish wash on back, sides and flanks. *Young in juvenal plumage:* Marked like female but smoky-gray above; wings clove-brown; tertials broadly edged white; below grayish-white, belly slightly buffy; "bill and feet pinkish-buff, becoming black later" (J. Dwight).

Measurements. — Length 4.05 to 5.00 in.; spread 5.80 to 6.60; folded wing 1.75 to 2.25; tail 1.75 to 2.25; bill .44 to .56; tarsus .55 to .77. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (beginning in July) including body plumage and wing-coverts; first breeding plumage by partial prenuptial molt (February) involving head, chin and throat, young male now assuming the black mark on head; adult winter plumage by complete postnuptial molt; adults have a double molt as in young bird, a partial prenuptial and complete postnuptial molt.

Field Marks. — Tiny size, not much longer than kinglets and much more slender; blue-gray above, grayish-white below, with white eye-ring; black tail, outer tail-feathers showing much white in flight; shape and actions like little Catbird.

VOICE. — "Song, rarely heard, a low, pleasant, exquisite, warbling ditty, preceded by an introductory note or two, and beautifully finished: *zee-u, zee-u, ksee-ksee-ksee-ksee-ksee-ksu,* occasionally cut short, frequently only a note or two, *pseety-pseet-ee* or *pse-chety* or only a short *tse;* song has been likened to *tsang, tsang, here I am, here I am.* Call, a distinctive, thin, twanging, humming (1) *speee,* (2) *speeng,* (3) *sping,* or (4) *ting,* heard for quite a distance, resembling the sudden ting of a stringed instrument or the hum of a .22 rifle bullet; a mouse-like call; a mournful chirping; a scolding *spee-spee-spee* or *spee-spee-spee-chuh-chuh*" (G. F. Simmons). "Its song is a lisping, chattering, incoherent warble, now faintly reminding one of the Goldfinch, now of a miniature Catbird, then of a tiny Yellow-hammer, having much variety, but no unity, and little cadence" (John Burroughs).

BREEDING. — Usually anywhere among large trees, those near water apparently preferred. *Nest:* Usually in tall coniferous or deciduous tree, rarely in a small sapling; from 10 to 70 feet up, usually high; saddled on a limb; composed of soft materials felted together and ornamented outside with tree lichens, fastened with spiders' webs, resembling a hummingbird's nest. *Eggs:* 3 to 5, usually 5; .56 to .68 by .44 to .48 in.; greenish-blue to bluish-white spotted with varying shades of reddish-brown, slate and lavender; figured by E. A. Capen in "Oölogy of New England," Plate II, Fig. 3. *Dates:* April 17 to May 9, South Carolina; May 5 to 15, Virginia; May 10 to July 9, Indiana. *Incubation:* Period, no data; by female. One brood yearly; said to have two at times in the extreme south.

RANGE. — Southern Ontario, eastern United States west to the Plains, Mexico, Guatemala and Cuba. Breeds chiefly in Upper and Lower Austral zones from eastern Nebraska, northern Iowa, central Wisconsin, southern Michigan, southeastern Ontario, central-western New York (casually) and southern New Jersey south to southern Texas, southern Louisiana, southern Alabama and central Florida and west to eastern Kansas and central Oklahoma; winters from southern Texas, southern Louisiana, southern Mississippi, eastern South Carolina and eastern North Carolina (casually) to the Bahamas, Cuba, Isle of Pines and through eastern Mexico to Chiapas, Yucatan and Guatemala; casual in southeastern Minnesota, northern Michigan, Connecticut, Rhode Island, Massachusetts and Maine.

DISTRIBUTION IN NEW ENGLAND. — A casual visitor and probable summer resident. Records: *Maine:* Cape Elizabeth, August 29, 1880, one seen by Nathan Clifford Brown;[1] Monhegan Island, September 5, 1915, and August 30, 1916, one observed by Professor Warner Taylor; August 20, 22, September 1, 2 and 11, 1917, "one bird each day" seen by many observers; September 11, 1918, one seen by Judge Charles F. Jenney and Dr. J. W. Dewis; October 6, 1918, one seen by Bertrand H. Wentworth;[2] Portland, August 25 and 26, 1912, one seen by Nathan Clifford Brown;[3] Gorham, May 28, 1924, one seen by Mrs. Herbert Lombard;[4] Ogunquit, October 2, 1925, two seen and identified by Mrs. Henry W. Rice and Mrs. Howard L. Hillman, reported by Miss Adelaide Stockwell.[5] *Vermont and New Hampshire:* Doubtfully recorded. *Massachusetts:* Six records are given by Howe and Allen in "The Birds of Massachusetts" (1901, p. 98), and I have many letters reporting later records (see distribution map). *Rhode Island:* Silver Springs, June 24, 1875, a male taken by Erwin I. Shores;[6] Block Island, September 11, 1919, one seen by Miss Elizabeth Dickens.[7] *Connecticut:* Six records are given by Sage, Bishop and Bliss in "The Birds of Connecticut" (1913, p. 176). West Haven, one seen April 30, 1914, Aretas A. Saunders;[8] New Haven, April 21, 1917, a female seen in Edgewood Park, reported by Mrs. Edwin A. Hayes;[9] South Windsor, November 3, 1923, one seen by 25 members of the Hartford Bird Club, reported by C. W. Vibert;[10] Plantsville, May 3, 1926, bird observed by Mrs. Frank Morse, reported by Mrs. Lucy Stock Chapin;[11] New London, September 20, 1927, one seen by Mrs. Charles B. Graves.[12]

SEASON IN MASSACHUSETTS. — April 30 to November 9 (November 20, December 18).

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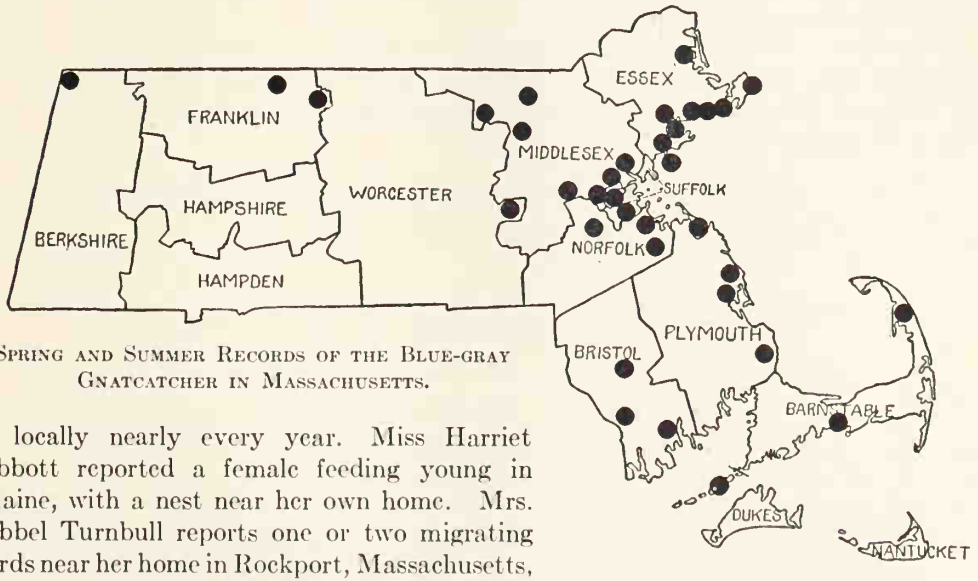
[1] Proceedings, Portland Society of Natural History, December 4, 1882, p. 5.
[2] Maynard, C. J.: Records of Walks and Talks with Nature, Vol. XI, 1919, pp. 31, 32.
[3] Auk, Vol. XXIX, 1912, p. 546.
[4] Lombard, Mrs. Herbert: *in litt.*
[5] Stockwell, Miss Adelaide: *in litt.*
[6] Howe and Sturtevant: Birds of Rhode Island, 1899, p. 86.
[7] Dickens, Miss Elizabeth: *in litt.*
[8] Auk, Vol. XXXI, 1914, p. 402.
[9] Hayes, Mrs. Edwin A.: *in litt.*
[10] Vibert, C. W.: *in litt.*
[11] Chapin, Mrs. Lucy Stock: *in litt.*
[12] Graves, Mrs. Charles B.: *in litt.*

HAUNTS AND HABITS. The Blue-gray Gnatcatcher is a fidgety little midget. Tiny, slender and frail in appearance, with shape and manners that resemble those of the much larger active and fussy Catbird, nevertheless its littleness and defenselessness and its air of innocence and artlessness at once enlist our sympathy and interest. This bird is not such a mere accidental straggler in New England as it is generally believed to be, for it is not a very uncommon summer resident in extreme southern Ontario. Correspondents of the Division of Ornithology of the Massachusetts Department of Agriculture report



SPRING AND SUMMER RECORDS OF THE BLUE-GRAY GNATCATCHER IN MASSACHUSETTS.

it locally nearly every year. Miss Harriet Abbott reported a female feeding young in Maine, with a nest near her own home. Mrs. Sibbel Turnbull reports one or two migrating birds near her home in Rockport, Massachusetts, nearly every season. It has been taken or observed in New England in every month from April to December, excepting July.

Normally a wood bird, it may be looked for wherever trees and thickets grow. It seems to have a preference for tall trees. It is exceedingly active and graceful and may be seen dashing and skipping about amid the underbrush with twitching body, lifted wings and expanded tail, only to appear a moment later amid the topmost branches of some tall tree from which it launches into the air like a flycatcher in pursuit of some passing insect or hovers before some spray to peck off some small creature hiding there. Every dart after an insect is punctuated with a sharp snap of the bill which signalizes the end of some tiny life.

Mr. C. J. Maynard says of its song: "I never imagined that any bird was capable of producing notes so soft and low, yet each one given with such distinctness that the ear could catch every part of the wondrous and complicated song" which he describes as a "silvery warble which filled the air with sweet continuous melody."

Both birds labor together in the construction of the beautiful nest "after the humming-

bird's, the daintiest in the woods," but the female is the more assiduous nest builder. She often sits in the uncompleted nest and rounds its rim, pressing her breast against the inside wall and reaching over, smoothing the outside with her throat and bill in the manner of a warbler. The lichens with which the outside is covered and beautified are fastened down with spiders' webs or caterpillars' silk and the whole fabric when finished resembles a knot on a limb covered with tree lichens.

This species seems to fluctuate much in numbers from year to year. In the years of abundance small numbers reach New England and in years of scarcity the bird is exceedingly rare or absent from our territory.

Most of the active life of the Blue-gray Gnatcatcher is spent in catching small insects, many of them in flight. It is known to take locusts, joint-worms, flies, gnats, caddice flies, ants and other hymenoptera, wood-boring beetles, weevils and spiders. It also feeds on the cotton-leaf worm.

Economic Status. What little we know of the food of this bird indicates that it is a decidedly useful species.

Family **TURDIDÆ**. Thrushes, Solitaires, Stonechats, Bluebirds, etc.

Number of species in North America 15; in Massachusetts 8.

This group is composed of birds with small or slender bills slightly notched at tip; nostrils not covered by feathers but well developed bristles about mouth; primaries ten; tail-feathers twelve; tarsus "booted" except for lower part; toes deeply cleft; young in juvenal plumage more or less distinctly spotted above and below even when adults are unspotted. The thrushes evidently are among the most highly developed birds and include some of the finest songsters of the world. The Nightingale, Song Thrush and Blackbird of Europe and the Wood Thrush and Hermit Thrush of America belong in this group. They are forest birds. This is a large and nearly cosmopolitan family most numerously developed in the Old World but the total number of known species and subspecies in the two Americas is about 150.

Economic Status. Edward A. Samuels, the first official ornithologist of Massachusetts, in an article on the Robin in his book entitled "Birds of New England and Adjacent States" (1870, p. 157), says: "In fact, the *Thrushes* seem designed by nature to *rid the surface of the soil of noxious insects not often pursued by most other birds.*" Thrushes also destroy many insect pests that fall from the trees, and they do not stop there. In cases of unusual irruptions of tree pests the thrushes often attack them in the trees. Thrushes are supposed to do some harm by devouring ground-beetles, but those eaten by these birds are mostly such as become harmful by eating vegetation if their numbers are not held within normal limits; and apparently the ordinary destruction of them by birds helps to keep these insects within such limits.

PLATE 92

PLATE 92

GRAY-CHEEKED THRUSH
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BICKNELL'S THRUSH
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OLIVE-BACKED THRUSH
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HERMIT THRUSH
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WOOD THRUSH
Page 387

VEERY
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SUBFAMILY **TURDINÆ.** THRUSHES.

Number of species in North America 14; in Massachusetts 8.

Hylocichla mustelina (GMELIN). Wood Thrush.

Other names: SWAMP ANGEL; WOOD ROBIN.

Plate 92.

DESCRIPTION. — A large stout thrush with bill relatively large and stout, upper mandible down-curved at point; eyes large; wings rather long and pointed; tail rather short. *Adults in breeding plumage (sexes alike):* Above brown; tawny or russet on top of head shading into cinnamon-brown on back and wings, with strong tinge of olive or grayish-olive on rump, upper tail-coverts and tail; eye-ring white; sides of head white before eye (except a narrow faint dusky line running to eye), streaked with dusky-brown and white over ear-coverts, and lower jaw white or whitish, finely marked with black or dusky; below white tinged more or less buffy on upper breast, a dusky streak on each side of throat, some small dusky spots on lower throat, *breast, sides and flanks very distinctly marked* with large roundish or oval spots of dusky or black; iris dark hazel; "bill brownish, flesh-color on basal two-thirds of lower mandible; legs medium flesh-color, feet pale flesh-color" (Allan Brooks). *Adults in winter plumage:* Similar to spring adults but colors brighter; light streaks of ear-coverts, also lower throat and breast, more yellowish. *Young in first winter plumage:* Usually as adults but may average a little darker. *Young in juvenal plumage:* Like adults in color but spotted or streaked on top of head, hind neck and usually on upper back with tawny or tawny-olive; greater wing-coverts tipped with same and spots below less sharply defined; "bill and feet pale pinkish-buff, becoming slightly darker with age" (J. Dwight).

MEASUREMENTS. — Length 7.50 to 8.55 in.; spread 13.00 to 14.00; folded wing 4.00 to 4.50; tail 2.85 to 3.30; bill .70 to .81; tarsus 1.10 to 1.30. Female smaller than male.

MOLTS. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt involving body plumage, lesser wing-coverts and usually part of the other coverts; first nuptial plumage by wear; adult winter plumage by complete postnuptial molt (July, August); adults have only this one molt yearly and acquire breeding plumage by wear.

FIELD MARKS. — Size between Robin and Bluebird; largest and most robust of our true thrushes; bright brown above, becoming more olive-brown on rump and tail; white or whitish below with large rounded black or blackish spots on breast and sides; readily distinguished from our largest mocking thrush, the Brown Thrasher, by *smaller size, much shorter tail, round spots on breast* and large dark eye; the Thrasher has a yellow eye.

VOICE. — Notes, a liquid *quirt*, a low *tut tut*, a sharp *pit pit* or *pip pip* and a shrill *tsee tsee*. Song, a pure, clear, sweet, expressive, liquid refrain, often with a bell-like ending; usually composed of a series of triplets, each beginning with a high note, then a low one, then a trill, often highest of all, but the different phrases varying in pitch. It is calm, unhurried, peaceful, and unequaled in both power and beauty by any other woodland songster of New England. That of the Hermit Thrush is perhaps finer, though not so loud.

BREEDING. — Normally in lowland, moist woods or thickets near a swamp, spring, stream or lake. *Nest:* In a bush or low tree, usually from three to twelve feet up; composed of grass, leaves, bark fibers, pieces of paper, etc., with a layer of leaf mold and lined or partially lined with fine rootlets, but the materials used often vary considerably. *Eggs:* 3 or 4, rarely 5; 1.00 to 1.12 by .68 to .75 in.; ovate; greenish-blue much like that of Robin's egg, but smaller; figured by E. A. Capen in "Oölogy of New England," Plate I, Fig. 2. *Dates:* May 5 to 15, June 15 (second brood), Virginia; May 16 to 27, Pennsylvania; May 21 to June 6, Rhode Island; May 25 to June 26, Massachusetts. *Incubation:* Period 12

days (A. R. Dugmore); by female wholly or chiefly. One brood yearly in New England though said to rear two in the west and south.

RANGE. — Southeastern Canada, eastern and east-central United States to Middle America. Breeds in Transition and Austral zones from southeastern South Dakota, central Minnesota, central Wisconsin, northern Michigan, southeastern Ontario, northern New York, northern Vermont, central New Hampshire and southeastern Maine south to eastern Texas, southern Louisiana, southern Alabama and northern Florida and west to Kansas and central Oklahoma; winters from Puebla (south-central Mexico) to Nicaragua, Costa Rica and casually in Florida; casual in migration in the Bahamas, Cuba and Jamaica; accidental in southwestern Quebec, Colorado and the Bermudas.

DISTRIBUTION IN NEW ENGLAND. — *Maine:* Rare summer resident in southwestern part. *New Hampshire:* Rare summer resident north to White Mountain valleys. *Vermont:* Occasional summer resident up to 1,500 feet and north to region of Mount Mansfield. *Massachusetts, Rhode Island and Connecticut:* Common summer resident but less so than formerly.

SEASON IN MASSACHUSETTS. — (April 19, 26) May 1 to September 28 (October 10).

HAUNTS AND HABITS. The Wood Thrush usually arrives in Massachusetts between the fifth and the fifteenth of May. Soon after the males arrive the females also appear and there is much swift flight on their part and swifter pursuit as the ardent males follow all their twistings and turnings through the forest shades. Then, too, these woodland minstrels tune their lyres, and their music is excelled by few North American birds. It has an ethereal quality that sets the thrush apart from all others. As we listen we lose the sense of time, — it links us with eternity. Thoreau says of it: "The thrush alone declares the immortal wealth and vigor that is in the forest. Here is a bird in whose strain the story is told. . . . Whenever a man hears it he is young, and Nature is in her spring, wherever he hears it, it is a new world and a free country, and the gates of heaven are not shut against him."

As I have written elsewhere: "Among all the bird songs that I have ever heard, it is second only in quality to that of the Hermit Thrush. It is not projected upon the still air with the effort that characterizes the bold and vigorous lay of the Robin, or the loud and intermittent carol of the Thrasher. Its tones are solemn and serene. They seem to harmonize with the sounds of the forest, the whispering breeze, the purling water, or the falling of rain drops in the summer woods. As with most other birds, there is a great difference in the excellence of individual performers, and, while some males of the species can produce such notes as few birds can rival, this cannot truly be said of all. At evening the bird usually mounts to the higher branches of the taller trees, often upon the edge of the forest, where nothing intervenes to confine or subdue his 'heavenly music.' There, sitting quite erect, he emits his wonderful notes in the most leisurely fashion, and apparently with little effort. *A-olee*, he sings, and rests; then, unhurried, pours forth a series of intermittent strains which seem to express in music the sentiment of nature; powerful, rich, metallic, with the vanishing vibratory tones of the bell, they seem like a vocal expression of the mystery of the universe, clothed in a melody so pure and ethereal that the soul still bound to its earthly tenement can neither imitate nor describe it. The song rises and falls, swells and dies away, until dark night has fallen." [1]

[1] Useful Birds and Their Protection, 1907, p. 159.

The Wood Thrush is a denizen of cool woodlands, where rushing streams dally on their way among the moss-grown rocks, where rank ferns and lush mosses hide the oozy ground, and great swamp maples cast their shade.

When the pairs have mated and settled down for the summer we find most of them in low swampy woodland or near the wooded banks of lake or stream, though some choose dry wooded hillsides or thickets near the edge of the woods for their abode. Some even forsake the retirement of their woodland retreats to dwell in parks or about the abodes of man where they nest in ornamental trees or shrubbery and forage like Robins on the lawns.

Most authors assert that this bird uses mud in building the nest, which is doubtless true in some cases, but so far as my experience goes the substance actually used is wet leaf-mold which, when gathered from swamp or stream and dried in place, makes a firm layer similar to that of the actual mud in a Robin's nest. The materials used in the nests vary greatly. Sometimes they are composed largely of sticks, at other times of moss or lichens, and I have seen two that were ornamented with a mass of long strips of paper.

The young thrushes grow very rapidly and in eight or ten days are able to fly and seek food for themselves. The Wood Thrush gets a large part of its food on the ground where it scratches much about the roots of the shrubbery. When disturbed it is likely to fly up and light upon a limb where it gives utterance to its alarm notes and flirts its wings, though I believe that it rather seldom jets the tail in the manner so characteristic of the Hermit Thrush. The song usually continues until mid-July or if the season be not too dry a little longer. Then the birds become silent and retiring and finally slip away to the south almost unnoticed.

A full exposition of the food of the Wood Thrush as well as that of other thrushes found in New England is given in "Food Habits of the Thrushes" by Professor F. E. L. Beal,[1] to which the reader is referred. Suffice it to say here that the Wood Thrush seems to destroy few useful insects, little cultivated fruit and many destructive insect pests, such as May beetles, weevils (among them one that injures strawberry plants and another that eats grass roots), wood-boring beetles, the Colorado potato beetle, caterpillars, ants and flies. Mr. W. L. McAtee mentions among other items a two-lined chestnut borer, a red cedar borer, leaf-chafers, plant bugs, cicadas, leaf-hoppers, tree-hoppers and saw-fly larvæ.[2] In addition to all these pests the bird takes grasshoppers, crickets, wire-worms, cut-worms, hairy caterpillars such as the tent-caterpillar, forest tent caterpillar and larvæ of the gipsy and brown-tail moths, and also the pernicious rose beetle. Why say more?

Economic Status. As Mr. McAtee says, this bird "is a beautiful and melodious woodland friend, and should be the constant object of our protective care."

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[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 280, 1915, pp. 1–23.

[2] Roosevelt Wild Life Bulletin, Vol. 4, No. 1, 1926, p. 89.

Hylocichla fuscéscens fuscescens (Stephens). Veery.

Other names: WILSON'S THRUSH; TAWNY THRUSH.

Plate 92.

DESCRIPTION. — A rather small and slender thrush with slender bill; wings rather long and pointed, outer (spurious) primary shorter than primary-coverts; tail shorter than wing, about the length of secondaries measured from bend of wing; legs rather long and slender. *Adults in breeding plumage (sexes alike)*: Above tawny-brown, somewhat variable; lores whitish sometimes becoming grayish in front of eye; no distinct eye-ring; ear region narrowly streaked with brownish-white; lower jaw buffy-white becoming more buffy toward neck where streaked with tawny-brown; below chiefly white passing from buffy-white on chin and throat into pale buff or pinkish-buff on upper breast, the sides of which are brownish, sides of lower throat and whole of upper breast streaked or spotted with light tawny-brown, these spots becoming paler and grayer posteriorly (sometimes all spots and streaks below are very faint); sides and flanks light grayish-buffy or brownish; iris brown; "upper mandible brownish, lower mandible flesh-color; feet flesh-color" (Allan Brooks). *Adults in winter plumage:* Similar to spring plumage but averaging a little brighter. *Young in first winter plumage:* Similar to winter adults, but usually may be distinguished in autumn at least by buff spots at ends of retained juvenal greater wing-coverts. *Young in juvenal plumage:* Similar to adults but darker above with tawny spots and spotted and barred on lower throat and more faintly on breast, sides and flanks with clove-brown and tawny.

MEASUREMENTS. — Length 6.45 to 7.75 in.; spread 11.25 to 12.60; folded wing 3.70 to 4.25; tail 2.60 to 3.30; bill .60 to .71; tarsus 1.08 to 1.20. Female smaller than male.

MOLTS. — Similar to those of Wood Thrush except that in postjuvenal molt into first winter plumage, the juvenal greater wing-coverts apparently are usually retained.

FIELD MARKS. — Size, larger than Bluebird; a slender *light tawny-brown* bird, whitish below with tawny-brown V-shaped spots on a buffy breast, these spots less distinct than on other thrushes, and sometimes rather few and faint; no prominent eye-ring.

VOICE. — Call, " a low sharp *phew* or a higher *phee-oo*" (R. Hoffmann); also "*chips, chicks,* 'lisps' like those of Cedar Waxwing, and a harsh 'grating' sound in the mating season" (H. D. Minot). Song peculiar, with a singular metallic ring beginning loudly and gradually falling in pitch and volume "*chéúry, chéúry, chéúry, chéúry,* decreasing in tone to quite a faint lisp; then, after a short pause, the notes *cheou 'twit, tritter, 'tritter,* are uttered; and the whole is finished usually with the ejaculation, *chickwhêu*" (E. A. Samuels). "Mr. Ridgway regards it, as heard by himself in Utah, as superior in some respects to that of all others of the genus, though far surpassed in mellow richness of voice and depth of metallic tone by that of the Wood Thrush (*T. mustelinus*). To his ear there was a solemn harmony and a beautiful expression which combined to make the song of this surpass that of all the other American wood thrushes. The beauty of their notes appeared in his ears 'really inspiring; their song consisting of an inexpressibly delicate metallic utterance of the syllables *ta-weel'ah, ta-weel'ah, twil'ah, twil'ah,* accompanied by a fine trill which renders it truly seductive'" (T. M. Brewer).

BREEDING. — Chiefly in or near wooded swampy land or in woods or undergrowth near water; also on dry wooded hillsides. *Nest:* Usually on ground or raised a bit on sprouts or stems, at the foot of a bush, on a dead or sprouting stump, among rank ferns, on a fern-covered boulder or in a tussock, rarely in a bush or low in a tree (sometimes 8 to 10 feet up); composed chiefly of twigs, grasses, weeds, dead leaves and sometimes bark-strips, lined with fine grasses, rootlets, pine needles or horse hair. *Eggs:* 3 to 5, usually 4; .84 to .95 by .60 to .70 in.; ovate; greenish-blue; figured by E. A. Capen in "Oölogy of New England," Plate I, Fig. 7. *Dates:* May 15 to June 1, Virginia; May 20 to June 30, Massachusetts; May 30 to June 28 (July 26), Vermont. *Incubation:* Period 10 to 12 days (Mrs. R. B. Harding). One or two broods yearly.

RANGE. — Central, eastern and southeastern North America south to northern South America. Breeds in Lower Canadian and Transition zones from northern Michigan, southeastern Ontario, southern Quebec and southern Maine south to central Illinois, southern Indiana, northern Ohio, Pennsylvania, northern New Jersey, Long Island (southeastern New York), southern Connecticut and Rhode Island and in the Alleghanies to eastern Tennessee, southwestern North Carolina and northeastern Georgia; west in migration to Iowa and Missouri; migrates through Florida, Cuba, Yucatan and Central America; winters from Colombia to British Guiana and south-central Brazil.

DISTRIBUTION IN NEW ENGLAND. — Common migrant and summer resident generally except in northern Maine, and on higher elevations and some coastal localities of southern New England; usually present in highlands up to 1,500 to 1,800 feet.

SEASON IN MASSACHUSETTS. — April 26 to September 19 (October 6).

HAUNTS AND HABITS. Usually the Veeries or Wilson's Thrushes begin to arrive in Massachusetts during the first or second week in May. They come in silently in the night and unlike most of our local summer residents, rarely begin to sing until at least a week after their appearance. However, when walking through deciduous woods which they chiefly affect, one may now and then see them running along on the ground or hear their alarm notes.

They are fond of low moist woodlands, wooded swamps and the banks of streams, but they often live during the summer in woods of mixed oak and pine, on dry hillsides or even on the summits of low hills, though they are seldom seen at any great height on the mountains of New England. Usually they are rather shy and retiring, but in migration some of them visit city parks and gardens and become quite tame.

There seems to be a great difference of opinion regarding the excellence of the Veery's song. Professor O. W. Knight says that "the male sings (if you call it singing) very frequently at various times during the day and even occasionally at various hours of the night, being especially given to music at twilight. The song is a harsh, churning, grating, grinding '*fe-r-r-u-y*,' repeated several times in succession." Then he goes on to liken it to the sound produced by cog-wheels in some kind of machinery. Dr. Brewer damns the bird with too faint praise, for he considers the song "quaint but not unmusical." William Brewster speaks of its "clear flute-like voice." Robert Ridgway (as quoted above under *Voice*), considers its song "superior in some respects to all others of its genus." I myself consider it one of the finest of our thrush songs and have formerly written of it: "The song of this Thrush, one of the sweetest sounds of the woodland, is among the earliest notes of the morning, and is often heard during the day and in the dusk of evening. It consists of several ringing phrases or triplets, which its name Veery describes fairly well. It is not so full-toned as the songs of other Thrushes, but has an attenuated sound. Robert Ridgway expresses the quality of the phrases by the syllables '*taweel'ah, taweel'ah, twil-ah, twil-ah.*' The last two phrases are lower in tone than the first, and end with a vibrating chord which suggests the vanishing of the note into ethereal space. The melody often has a muffled sound when heard near-by, but at a distance it seems to ring out clear. To be fully appreciated, this song must be heard when one is alone in the deep woods, among the falling shades of the coming night. It breathes the spirit of the dying

day. Sometimes at evening these Thrush songs reply to one another like echoes in the moonlight." [1]

That brilliant and versatile ornithologist Dr. Elliott Coues says of this bird: "I rate the bird as one of the sweetest of our songsters of whose 'clear bell-like notes, resonant, distinct, yet soft and of indescribable sadness,' I have spoken on a former occasion." The same author thus graphically describes the bird's nesting place: "The heavy growth of timber that fringes the streams includes many nooks and dells, and broken ravines overgrown with thick shrubbery, from out the masses of which the tall trees tower, as if stretching forth their strong arms in kindly caressing of the humbler and weaker vegetation, their offspring. In such safe retreats, where the sombre shade is brightened here and there with stray beams of sunlight, in the warmth of which myriads of insects bathe their wings and flutter away their little span of life, humming a quaint refrain to the gurgle of the rivulet, the Veery meets his mate — the song rises — the wooed is won — the home is made. Should we force our unwelcome presence upon the bird who is brooding her newly-found treasures with the tenderest solicitude, she will nestle closer still, in hope of our passing by, till we might almost touch her; when, without a word of remonstrance or reproach, she takes a little flight, and settles a few yards away, in silent appeal. If the time, the place, the scene, suffice not for our forbearance, with what poor words of hers may we then be moved?" [2]

It is interesting to note in connection with the above that Mrs. Richard B. Harding, who spent a large part of a summer watching thirty nests of this species in New Hampshire and who has kindly given me her notes, is positive that the bird usually rears two broods there. The building of the nests required from six to ten days depending on the weather. By using a blind she was able to watch a nest from the time the young were hatched until they left it. Mrs. Harding says that both parents joined in guarding and defending the young. The male was most aggressive in driving other birds away from the nesting area and attacked red squirrels and chipmunks which trespassed upon his precincts, flying at them with great fury. The young were not fed by regurgitation on the first day, but with small hairless caterpillars together with soft white grubs and other small insects, all of which had been thoroughly bruised between the mandibles of the parent bird. This diet was continued for about four days. On the fifth day dragon-flies and slugs were added and a day or two later black swallow-tailed butterflies were added. The capture of many dragon-flies and butterflies indicates that this thrush is a skilful flycatcher as such insects are swift, erratic fliers. The Veeries having raised their young begin to depart for the south in August and most of them have left us by the 10th of September.

According to Professor F. E. L. Beal, the food of the Veery is divided into 57.27 per cent animal matter, mostly insects, and 42.73 per cent of vegetal matter, mainly fruit, and as the Veery keeps mostly to the woods the fruit eaten is chiefly wild fruit. The bird eats a few ground-beetles, more weevils such as the plum curculio, and other harmful

[1] Useful Birds and Their Protection, 1907, pp. 156, 157.

[2] Birds of the Colorado Valley, 1878, pp. 41, 42.

species, such as wood-borers, leaf-chafers, strawberry-crown girdlers, clover-root borers, and bark-beetles, many ants, a few bugs, many caterpillars, saw-fly larvæ, some spiders and a smaller number of sow-bugs and snails. A few seeds of grasses and weeds are taken.[1]

Economic Status. Mr. W. L. McAtee of the Biological Survey says: "The bird seems to do little or no harm, and feeds on various destructive insects, so deserves protection for its usefulness, as well as it does in an eminent degree for being an adornment to the forest, both in appearance and song." [2]

Hylocichla fuscescens salicícola Ridgway. Willow Thrush.

Other name: NEWFOUNDLAND THRUSH.

Note. This is the race described by Reginald Heber Howe, Jr., as *Hylociehla fulignosa*, the Newfoundland Thrush, but it is now considered by the American Ornithologists' Union Committee as inseparable from the western race *H. f. salicicola* and by Ridgway as synonymous with the eastern race *H. f. fuscescens*. Following the American Ornithologists' Union Check-List of 1910 it is included here as *H. f. salicicola*.

Description. — Form as in Veery "but coloration duller, the brown of upper parts less tawny (varying from deep isabella-color to nearly broccoli-brown), and brown streaks on upper chest and sides of lower throat averaging darker" (Ridgway).

Measurements, Molts, Field Marks, Voice, Breeding, Haunts and Habits. — So far as I know this bird is virtually identical with the Veery, the two races differing only in a shade of color and in distribution.

Range. — Western and central North America and Newfoundland, to northern South America. Breeds in lower Canadian and Transition zones, from southern British Columbia, central Alberta, central Saskatchewan, southern Manitoba, northern Minnesota and northern Wisconsin south to central and southeastern Oregon, northern Nevada, northern Utah, northern New Mexico, central and northeastern Iowa and in Newfoundland; migrates through southeastern Ontario (casually), the United States, Mexico, Central America, and (probably) West Indies; winters from Colombia to south-central Brazil.

Distribution in New England. — Rare migrant, recorded in Massachusetts, Rhode Island and Connecticut. Records: *Massachusetts:* Waltham, October 5, 1889, one taken, and Lanesboro, September 27, 1900, another taken by Walter Faxon.[3] *Rhode Island:* Newport, September 25, 1885, one taken by R. L. Agassiz; Bristol, September 24, 1899, a male taken by R. H. Howe, Jr.[4] *Connecticut:* Woodbridge, May 5, 1894; New Haven, September 23, 1895; East Haven, May 16, 1900, and May 14, 1904; in each instance an adult male was taken by L. B. Bishop.[5]

Hylocichla alíciæ aliciæ (Baird). Gray-cheeked Thrush.

Other name: ALICE'S THRUSH.

Plate 92.

Description. — Form much like Veery but somewhat heavier and stouter. *Adults in breeding plumage (sexes alike)*: Above, olive or grayish-olive becoming slightly browner on tail; sides of head (variable) grayish-olive, with indistinct grayish-white eye-ring; ear region narrowly streaked with whitish, and

[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 280, 1915, p. 9.
[2] Roosevelt Wild Life Bulletin, Vol. 4, No. 1, 1926, p. 90.
[3] Auk, Vol. XVIII, 1901, p. 198.
[4] Howe and Sturtevant: Birds of Rhode Island, 1899, p. 86.
[5] Sage, Bishop and Bliss: Birds of Connecticut, 1913, p. 177.

lower jaw becoming whitish tinged with grayish-olive and streaked darker; below white becoming faintly buffy on upper breast and grayish-olive on sides and flanks; a distinct long dusky streak along each side of throat; upper breast and sometimes lower throat marked with small triangular spots of blackish, these changing form and widening posteriorly; lower breast marked chiefly on sides with lighter cross spots of grayish-olive; bill dusky, basal half of under mandible yellowish; iris brown; legs and feet flesh-color, the feet a shade darker with pale bottoms (N. S. Goss). *Adults in winter plumage:* Similar but colors brighter, the creamy-buff of upper breast richer. *Young in first winter plumage:* Similar to adults in fall and winter but averaging perhaps a trifle lighter, and usually showing some buffy edgings or terminal spots on the wing-coverts. *Young in juvenal plumage:* Similar to first winter plumage but sides of head buffy, spotted with blackish, many pale buffy shaft-streaks or subterminal spots above and much blackish cross-spotting or broken barring below, except on chin, upper throat, abdomen and under tail-coverts; lesser and middle wing-coverts with central streaks of pale yellowish-buff and greater wing-coverts edged and often tipped with same.

Measurements. — Length 7.50 to 8.00 in.; spread 12.30 to 13.50; folded wing 4.00 to 4.40; tail 2.95 to 3.40; bill .63 to .71; tarsus 1.12 to 1.30. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August) involving body plumage and lesser wing-coverts; first breeding plumage by wear and adult winter plumage by complete postnuptial molt; adults have only one molt (complete, postnuptial) and acquire breeding plumage by wear.

Field Marks. — A large thrush quite as long as Wood Thrush, but somewhat more slender. Entirely olive above like the Olive-backed Thrush but *sides of head* including eye-ring, *are not* buffy as in that species but olive-grayish, the *eye-ring whitish* and very inconspicuous. The bird is also whiter below than the Olive-backed Thrush, not so buffy on breast.

Note. Field identification of the Gray-cheek and Olive-back in the woodland shadows is very difficult and often impossible, but the Gray-cheek may be distinguished easily from the Wood Thrush which latter is rather tawny above turning to olivaceous on the rump. The Hermit is olive above turning to tawny on the rump and the Veery is tawny from head to tail while the Gray-cheek and the Olive-back are entirely olive above. To distinguish Gray-cheek from Olive-back is more difficult; the side of the head must be seen in strong light; often this is impossible but when so seen, if top of head and cheek are both gray, with "no tawny on head or tail, the bird is a Gray-cheeked Thrush" (R. Hoffmann).

Voice. — Call note, a melancholy whistled *whéu* (H. D. Minot), or *phéu*, sometimes faint and sometimes loud. Alarm note, a loud *spee-a* with a vibratory character, resembling at times that of Nighthawk and at times that of Veery. Song, "when heard at close range, is sometimes introduced by faint and curious sounds as if the bird were breathing through its nose; then there is a single or double first note followed by a long Veery-like vibration, sweet yet mournful; not noticeably different from that of Bicknell's Thrush" (Townsend and Allen).

Breeding. — In northern thickets among birches or in willows and alders, near banks of streams. *Nest:* In bushes or on low branches of trees 2 to 12 feet up, sometimes on ground. Composed of leaves, sedges, stems and grasses, lined with fine grass and strips or shreds of bark, sometimes with a mud base. One was composed of hair, feathers and a little moss; some are built mainly of moss. *Eggs:* Usually 3 or 4; .88 to .93 by .62 to .69 in.; ovate; bluish-green or greenish-blue with a very variable number of spots and blotches of reddish-brown sometimes thinly distributed and sometimes massed on part of the egg. *Dates:* June 1 to June 20, western Alaska; June 12 to 23, northern Mackenzie. *Incubation:* No information.

Range. — North America (except southwestern part), Central America and northern South America. Breeds in Hudsonian Zone from tree limit in northeastern Siberia, northwestern Alaska, northern Mackenzie, northern Manitoba and northern Ungava (Quebec) south to central-southern Alaska, northern British Columbia, northern Alberta, northern Saskatchewan, north-central Manitoba, northern Ontario, southeastern Quebec and northern Newfoundland; in migration west to eastern Montana, Nebraska,

Kansas, Oklahoma and Texas; migrates through Cuba (casually), Santo Domingo, Cozumel and Ruatan Islands, and along the Atlantic coast of Central America; winters in Colombia, Ecuador, northern Peru, Venezuela and British Guiana; accidental in Greenland, Heligoland and Italy.

DISTRIBUTION IN NEW ENGLAND. — Uncommon to rare migrant.

SEASON IN MASSACHUSETTS. — May 16 to June 3; September 15 to October 28.

HAUNTS AND HABITS. See under Bicknell's Thrush, below.

Hylocichla aliciæ bicknelli RIDGWAY. Bicknell's Thrush.

Plate 92.

DESCRIPTION. — Form like Gray-cheeked Thrush but smaller and bill *averaging* more slender. *Adults (sexes alike)*: Colors virtually the same as in Gray-cheeked Thrush but *averaging* browner above and often more buffy below. *Young in juvenal plumage:* Similar to young of Gray-cheeked Thrush but much browner above and upper breast decidedly more buffy.

MEASUREMENTS. — Length 6.25 to 7.40 in.; spread 10.50 to 11.60; folded wing 3.40 to 3.80; tail 2.60 to 2.90; bill .59 to .68; tarsus 1.10 to 1.25. Female smaller than male.

MOLTS. — Same as those of Gray-cheeked Thrush (see page 394).

FIELD MARKS. — Probably cannot be distinguished from Gray-cheeked Thrush in the field; the two races intergrade so that it is often difficult to distinguish them in the hand; field marks are the same as those already given above for Gray-cheeked Thrush.

VOICE. — Calls, a loud, harsh, penetrating *queep* or shortened to *quee* or varied to *queeah* with falling inflection, sounding at a distance not unlike the cry of a Nighthawk. Song, like that of the Olive-backed Thrush, but once in the course of five or six repetitions, a flute-like *per-pseueo pseueo* is interpolated (Wm. Brewster). It has the quality of a fine high-pitched reed but "unlike the Olive-backed Thrush it does not change its pitch perceptibly. The syllables *wee-a, wee-a, wee-a, chi-chi-wee*, the opening notes *wee-a* are open and flowing, followed by two staccato notes; the closing note resembling the opening one is without special emphasis" (A. H. Howell). The last three syllables are characteristic of the song and are often given without the first part. The song may be written "*te-deé, dee͡-a, te-dee͡-ee*, with a slurring effect on all the long syllables" (R. Hoffmann).

BREEDING. — In New England on higher mountains usually where spruce and fir are found; farther north nests on lower lands among the spruce or other cone-bearing trees. *Nest:* In low bushes or trees only a few feet up, rarely 15 to 25 feet (Seal Island, Yarmouth County, Nova Scotia); composed of dried grasses, twigs and moss. *Eggs:* Usually 3; similar to those of Gray-cheeked Thrush, but smaller; greenish-blue with brown spots.

RANGE. — Central and southeastern North America (east of the Rockies) to the West Indies and northern South America. Breeds in Hudsonian and Canadian zones from central Newfoundland, the Magdalen Islands and northern Maine south to southeastern New York, western Massachusetts, north-central New Hampshire and southern Nova Scotia; in migration west to Saskatchewan and south through southeastern United States and the Bahamas; winters from Haiti to Colombia.

DISTRIBUTION IN NEW ENGLAND. — Uncommon to rare migrant; common to rare summer resident on higher mountains from about 3,000 feet to timber line. Possibly some of the birds breeding on mountains of northern Maine may be referable to the Gray-cheeked race, *H. a. aliciæ*, but that race is not definitely known to breed south of the St. Lawrence River.

SEASON IN MASSACHUSETTS. — May 2 to May 30 (summer on Mt. Greylock); September 18 to October 25.

HAUNTS AND HABITS. The two races of *Hylocichla aliciæ*, the Gray-cheeked Thrush and Bicknell's Thrush, may well be treated together here, since their haunts and habits

are practically identical and it may be possible that both breed on some of the mountains of northern New England. It is practically impossible to distinguish them in the field as there is no recognizable difference in color between them. Their notes and songs are essentially the same. They may even intergrade in size, overlooking the fact that we have established measurements which usually will determine the race of an individual. If we see one of these birds in the field early in May it is probably *bicknelli*, for this race begins to migrate through New England earlier than the Gray-cheeked Thrush. So also if we find one in the breeding season on any New England mountain we may assume that it is *bicknelli*. Otherwise I know of no way to differentiate the two birds in the field, especially as they are both normally shy and resort largely to shady places where fine points are not easily determined except perhaps with the best of eyes and glasses. It may be possible also that some of the birds that breed on the mountains of extreme northern New England are referable to *H. a. aliciæ*, though the Gray-cheeked Thrush is not supposed to breed south of the St. Lawrence River. *Aliciæ* breeds north to the Arctic Ocean and west to Bering Sea, while *bicknelli* is merely a smaller, more southeastern race of the Canadian-Hudsonian Fauna.

Brewster says of these birds in migration, referring to both races, "Like most of the spotted-breasted Thrushes belonging to the genus *Hylocichla* they dislike strong sunlight, which, no doubt, is trying to their fine, large, dreamy-looking eyes. In the spring, they frequent, for the most part, upland woods and thickets where there are crowded growths of young pines or other evergreens or where the ground is deeply carpeted with fallen leaves, among which they search industriously for worms and the larvæ of insects. In autumn, when they subsist largely on berries, they are found oftenest in dense, moist thickets, such as those in the Fresh Pond Swamps, where they eat the fruit of the cornels and of the deadly nightshade. They may also be seen along country roads and lanes bordered by woodland, where they feed on the berries of the barberry, spicebush, wild grape, woodbine and poison ivy. When met with in retired places they are almost invariably silent and so shy that it is difficult to approach them closely; but in our garden, where they occur very regularly late in May and more or less frequently in October, and where they often linger for days in succession, they soon become accustomed to our presence and comparatively tame. Indeed we often see them hopping about over the flower-beds, along the garden walks, and on the turf under the trees, almost as boldly and familiarly as the Robins. In this garden, moreover, they sometimes sing a little, usually at morning or evening, or during rainy weather." [1]

On their breeding grounds both of these thrushes are so shy that it is of little use to follow them as ordinarily they will not permit a close approach. They will come close, however, to a quiet sitter, especially if he imitates the cry of a bird in distress but even then they usually keep well concealed behind the foliage and quiet sitting on the part of a watcher is somewhat difficult where black flies and mosquitoes are rampant.

In my opinion the songs of these thrushes cannot compare with those of the Hermit

[1] Brewster, William: Birds of the Cambridge Region, 1906, pp. 386, 387.

Thrush, the Wood Thrush or even the Veery. They may be ranked between the song of the Veery and that of the Olive-backed Thrush — a rather inferior thrush song. Mr. Brewster, who likens the song of Bicknell's Thrush to that of the Olive-backed Thrush, also tells of its resemblance to that of the Veery in the following words: "The song is exceedingly like that of the Veery, having the same ringing, flutelike quality; but is more interrupted, and it ends differently — the next to the last note dropping a half tone, and the final one rising abruptly and having a sharp emphasis." To my own ear the songs of the Veery and the Olive-backed Thrush have little in common and if that of Bicknell's Thrush closely resembles both it must be quite variable.

In the breeding season Bicknell's Thrush may be found among the stunted spruces and firs near the summits of New England mountains, mostly about 3,000 feet altitude or higher to timber line, often in the same woods with the Olive-backed Thrush. The bird is more loquacious than the Olive-backed Thrush and usually more shy and therefore, will be heard much more often than it is seen.

Professor F. E. L. Beal reports on the food of the two races of *H. aliciæ*, the Gray-cheeked Thrush and the Bicknell's Thrush. His conclusions are not final as he had only 111 stomachs of both races, only four of which were taken in summer, but even so the food contents were almost three-fourths animal and but 25.14 per cent vegetal. The animal food was almost entirely insects and spiders with a few crawfish, sow-bugs and angleworms. Among the beetles found only 2.83 per cent were useful species. The rest of the animal food consisted of harmful beetles such as weevils, ants, grasshoppers, caterpillars, the seventeen-year cicada, flies, bugs and some wasps and wild bees (no honey bees). Among the vegetal food we find berries of pokeweed, sumac, black alder, flowering dogwood, sour gum, black nightshade, dockmackie, arrowwood, elder and wild sarsaparilla, also bayberries, wild black cherries and wild grapes.

Economic Status. Professor F. E. L. Beal says: "The vegetable food, drawn entirely from nature's storehouse, contains no product of human industry, either of grain or fruit. Whatever the sentimental reasons for protecting this bird, the economic ones are equally valid." [1]

Hylocichla ustuláta swaínsoni (Tschudi). **Olive-backed Thrush.**

Other names: swainson's thrush; swamp robin.

Plate 92.

Description. — Form similar to that of Veery but slightly stouter. *Adults in breeding plumage (sexes alike)*: Above uniform dusky-olive with a slight brown tinge; stripe over eye, ring around it, lores, throat and upper breast rich cream or ochraceous-buff, latter, and sides of throat spotted with dark brown or dusky; elsewhere below white or whitish; sides washed with olive-gray; iris brown; "bill dusky-blackish, base of lower mandible flesh-colored; feet pale purplish-flesh-color" (Allan Brooks); bill dusky, under mandible pale straw-color at base; legs pale brown, feet and claws a shade darker

[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 280, 1915, pp. 12, 13.

(N. S. Goss). *Adults in winter plumage:* Similar to adults in spring but somewhat brighter in color both above and on throat and breast. *Young in first winter plumage:* Similar to fall and winter adults but showing some buffy spots on wing-coverts. *Young in juvenal plumage:* Much darker than adults above, each feather, except on rump and upper tail-coverts, showing a tear-shaped spot of buff; breast like adult but feathers of lower breast and sides barred at tips with dull black; fore part and sides of abdomen barred indistinctly; "bill and feet dark pinkish-buff, remaining pale when older" (J. Dwight).

Measurements. — Length 6.35 to 7.76 in.; spread 10.50 to 13.00; folded wing 3.00 to 4.40; tail 2.80 to 4.00; bill .58 to .67; tarsus 1.00 to 1.50. Female smaller than male.

Molts. — Similar to those of Gray-cheeked Thrush (see page 394).

Field Marks. — A rather large thrush all olive above; *stripe over eye* and faint eye-ring, buffy; cheeks have a buffy tinge which may be seen in good light, spotting of breast not so heavy as in Wood Thrush, and the bird is nowhere tawny; occasionally raises its tail slowly but not so habitually as does the Hermit Thrush.

Voice. — Notes, a *queep*, a whistled *whit*, a *chuck* of alarm, a feeble *tsip* and a cry of *chick, chick-a-sit*, etc., like that of the Slate-colored Junco (H. D. Minot). Alarm note on the breeding grounds *che-urr, che-urr*, another alarm note, a high-pitched *puk* (E. H. Eaton). Song, the first note loud and liquid, after which the melody is fainter, seeming to dissolve upon the ear like the spent vibrations of a stringed instrument (Eugene Bicknell). There is a slight resemblance to the song of the Veery but it rises at the end, going up the scale rather than down as does the Veery's song, yet it seems heavier and less musical than songs of other thrushes.

Breeding. — In deep woods and forests among coniferous trees, spruces, firs, pines, etc. *Nest:* In bush or tree (usually spruce or fir) from 4 to 15 feet up; composed of leaves, mosses, twigs, grass, stems, etc., and lined commonly with rootlets. *Eggs:* 3 to 5, often 4; .86 to .95 by .61 to .70 in.; ovate to rounded ovate; light greenish-blue spotted and blotched (often sparingly dotted) with reddish-brown, darker brown and lilac; figured by E. A. Capen in "Oölogy of New England," Plate I, Figs. 5, 6. *Dates:* June 16 to July 11, New Hampshire; May 29 to early July, Maine. *Incubation:* Period 10 to 13 days (F. L. Burns); chiefly by female. One brood yearly.

Range. — North America, Central America and South America. Breeds in Hudsonian and Canadian zones from northwestern Alaska, northern Yukon, northwestern Mackenzie, northern Manitoba, northern Ontario, southern Ungava (Quebec) and Newfoundland south to Kenai Peninsula in Alaska, north-central California, central Nevada, northern Utah, southern Colorado, southern Manitoba, central Minnesota, northern Michigan, southeastern Ontario, southern New York, southern New Hampshire, southern Maine, southern New Brunswick, Nova Scotia and in the mountains from western Massachusetts to Pennsylvania and western North Carolina; migrates through southern United States and through Mexico; winters from southeastern Mexico through Central America to Venezuela, British Guiana, Brazil, Peru, Bolivia and Argentina; casual in Cuba and Bermudas; accidental in Italy.

Distribution in New England. — *Maine:* Common migrant; common summer resident in northern and eastern parts. *New Hampshire:* Common migrant; common summer resident from White Mountains northward, local to the southward. *Vermont:* Common migrant; less common summer resident, becoming local in southern parts and below 1,200 feet elevation. *Massachusetts:* Common migrant; breeding rarely or locally in western counties and east to northern Worcester County above 1,200 feet elevation. *Rhode Island and Connecticut:* Common migrant.

Season in Massachusetts. — May 3 to June 7 (summer); September 9 to October 21.

Haunts and Habits. Among the hills of western Massachusetts there remain isolated remnants of the spruce growth that clothed them in the days of yore. There today in the murmuring forest, tall, straight columnar trees still stand, their serried ranks extending far up the mountain sides. As they fall in death, succumbing to age or the ax

Photograph by Miss Cordelia J. Stanwood

FIG. 96. — OLIVE-BACKED THRUSH IN JUVENILE PLUMAGE

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Photograph by Miss Cordelia J. Stanwood

FIG. 97. — NEST AND EGGS OF HERMIT THRUSH

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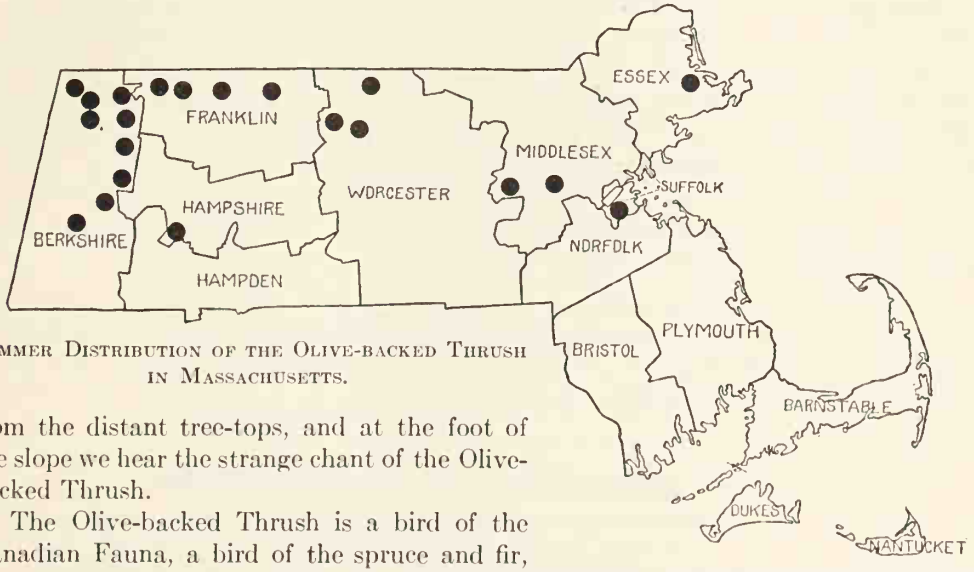
of the woodsman, the sun streaming in between the remaining trunks stimulates the seeds buried by birds and squirrels in the soft mold of the forest floor and starts a dense miniature forest of beautiful little spruces. In time these cover the ground to replace the ancient wood and hide the great, moss-covered, decaying trunks on the ground. Here and there young trees of moosewood and black birch are growing, and little brooks fringed by overshadowing ferns prattle noisily down over their beds of age-old moss-grown rocks. Here the winds whisper the secrets of the forest and here the Hermit Thrush with time and eternity all his own, sings his unhurried, ethereal lay. Jays call mournfully



SUMMER DISTRIBUTION OF THE OLIVE-BACKED THRUSH IN MASSACHUSETTS.

from the distant tree-tops, and at the foot of the slope we hear the strange chant of the Olive-backed Thrush.

The Olive-backed Thrush is a bird of the Canadian Fauna, a bird of the spruce and fir, and its presence in the breeding season seems to be mostly confined to the region of these coniferous trees, but like many other birds it frequents both mixed and deciduous woods during migration, also orchards, gardens and parks where there are trees and shrubbery. Occasionally it searches for grasshoppers, locusts and other insects in open fields near the borders of woods. I have seen a small flock scattered about like Robins in such a field. The bird seems to feed more in the trees, however, than most thrushes and is especially active in catching tree insects. Although the Olive-backed Thrush usually is rather shy, it seldom manifests the extreme caution so often observed in the Gray-cheeked Thrush, and some individuals become quite tame when unmolested.

The Olive-backed Thrush seldom appears in any numbers in Massachusetts much before the middle of May, though some stragglers may come early in the month. The comparatively few individuals that nest here seem to prefer moist or swampy spruce thickets or spruce woods near streams. In its northern wilds it may be found generally in spruce woods wet or dry, and often in mixed or deciduous woods, usually, however, nesting among spruce, hemlock, fir or pine woods.

The Olive-back is the most common thrush in the woods of northern and eastern Maine. Years ago in the great woods of eastern Maine, I saw an irruption of bud-moths among the spruce trees and there from every direction came the song of the Olive-backed Thrush and that of the Hermit Thrush, about five of the former to one of the latter. The birds were so abundant in the moth-infested region in July that it seemed that they must have gathered there especially to feed upon the moths which they often pursued through the air in the manner of flycatchers.

Professor F. E. L. Beal of the Bureau of Biological Survey studied the contents of 403 stomachs of the Olive-backed Thrush and its congener, the Russet-backed Thrush of the Pacific states. He found their food to comprise 63.52 per cent animal matter and 36.48 per cent vegetal matter. Beetles, which formed 16.29 per cent of the food, included some useful varieties, but also included weevils and the Colorado potato beetle. Hymenoptera formed 21.50 per cent of the total, caterpillars 10.30 per cent, grasshoppers and crickets 2.42 per cent, diptera 6.23 per cent and the remainder of the animal food consisted of bugs, spiders, snails, sow-bugs, angleworms and scales. The vegetal food consists largely of small fruits, mostly of wild varieties, though a few domesticated blackberries and raspberries may be taken. It also eats weed seeds to some extent.[1]

Economic Status. The Olive-backed Thrush destroys many injurious insects and only a few beneficial species, and its vegetal food is almost exclusively composed of wild fruits. It is probably of more value to forestry than to agriculture, as it seldom comes in contact with the products of the farmer or gardener.

Hylocichla guttâta pâllasi (Cabanis). **Hermit Thrush.**

Other names: SWAMP ANGEL; SWAMP ROBIN.

Contributed by Maurice Broun.

Plate 92.

Description. — Only New England thrush with rump and tail deep reddish-brown, in contrast to the olive-brown or russet-brown of rest of upper parts. *Adults in spring and summer (sexes alike)*: Above plain olive-brown, the upper tail-coverts and tail pale rufous; under surface of wing-coverts, including basal half of secondaries and primaries pinkish-buff (showing through on upper wing, when wing is spread); a conspicuous eye-ring of dull white; lores dull whitish mixed or suffused with dusky-grayish; region around ears grayish-brown, with very narrow shaft-streaks of dull whitish; cheeks and under parts dull white, the chest and hind part of cheeks tinged more or less strongly with pale cream-buff; a dusky or sooty streak below cheeks along each side of throat; sides of lower throat with narrow wedge-shaped streaks of dusky; chest with large triangular spots of dusky-grayish-brown or sooty, these more wedge-shaped on upper chest, broader and more rounded on lower chest; upper breast, especially on lateral parts, spotted with grayish-brown or brownish-gray; sides and flanks light brownish-gray; bill dusky-brown or blackish, the basal half of mandible pale yellowish (pale grayish-flesh-color in life); iris dark brown; legs and feet flesh-color. *Adults in autumn and winter:* Similar to the above, but more brightly colored, the general color of upper parts more brownish, upper tail-coverts and tail more ruddy-brown, and chest

[1] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 280, 1915, pp. 13–18.

more strongly buffy, with spots darker, sometimes nearly black. *Young in juvenal plumage:* Above brown, as in adults, but whole top of head, hind neck, back and scapulars, and lesser wing-coverts streaked with buffy, the upper tail-coverts broadly tipped with yellowish-brown, the middle wing-coverts with a wedge-shaped or spotted mark of buff; under parts dull white, more or less strongly tinged with buff on chest and sides, the chest and sides of lower throat conspicuously spotted, the breast, upper abdomen and sides barred with black or dusky; a blackish streak extending from lower cheeks along each side of throat; upper mandible grayish-brown, lower mandible flesh-color, except tip, which is grayish-brown; iris hazel; legs and feet a mixture of flesh-color and brownish-gray (Miss C. J. Stanwood).

Measurements. — Length 6.50 to 7.60 in.; spread 11.00 to 12.00; folded wing 3.42 to 3.90; tail 2.50 to 2.95; bill .61 to .68; tarsus 1.20 to 1.25. Sexes average alike in size.

Molts. — Juvenal plumage succeeds natal down by complete postnatal molt; first winter plumage acquired by a partial postjuvenal molt of body plumage and most of wing-coverts (late August to October); first breeding plumage produced by wear; second winter plumage acquired by a complete postnuptial molt (August, September), young becoming like adult; breeding plumage acquired by wear.

Field Marks. — A trifle larger than Bluebird. Distinguished from Gray-cheeked, Bicknell's and Olive-backed Thrushes by browner back merging into *rufous on rump and tail.* The marks on the chest and sides of the Hermit are darker and heavier than those of its near relatives, with the exception of the Wood Thrush, and are wedge-shaped, while those of the latter are round. The characteristic habit of slightly raising and lowering the tail, especially after alighting (usually accompanied by the "chuck" note), is peculiar to this species alone. Not infrequently the Fox Sparrow is confused with the Hermit Thrush; although both have reddish-brown tails, the former differs from the thrush in having the head, back, and breast markings the same color as the tail, and the bills are different.

Voice. — Notes, a low, soft *chuck;* a sweet, low whistle in the breeding season; a loud *tway,* suggesting the call of the Towhee (Henry R. Carey); when disturbed on its breeding ground "a harsh nasal *speke,* or a thin, hissing note, like the Robin's" (R. Hoffmann); fledglings give "a clear, sweet whistle, *p-e-e-p! p-e-e-p!* a soft, husky, breathing sound, *phee, phee,*" and occasionally "*pit! pit! pit!* an almost inaudible, ventriloquial call" (Miss C. J. Stanwood). Song consists of several strains of different pitch, each of which is introduced by a clear, firm, flute-like note, sometimes slightly crescendo, then followed by two or three (sometimes four) higher, vibratory notes, of soprano or mezzo-soprano quality, ascending and descending in tone, in no fixed order. No two strains are repeated in succession, and each strain tends to rise higher in the scale than the preceding one, until "fairly dizzying vocal heights are attained." The whole effect of its rich and mellow song is that of steady, deliberate, effortless execution and perfect delivery, until the climax is reached, when "the last clearly uttered notes fade away in a silvery tinkle."

Breeding. — Usually in cool, damp forests, or in swampy woodland undergrowths, beside wood roads or on the borders of woodland pastures; always more partial to localities with tracts of coniferous trees. *Nest:* On or very near the ground, generally in a knoll or hummock under some fir tree, bush or clump of ferns. A neat, compact structure, the foundation and exterior being composed of moss, twigs or bark, coarse grasses, dead leaves and pieces of dried ferns, lined with pine needles, delicate plant fibers or rootlets. *Eggs:* 3 to 5, usually 4; .83 to .92 by .63 to .69 in.; ovate to elongate ovate; plain greenish-blue; figured by E. A. Capen in "Oölogy of New England," Plate I, Figs. 3, 4. *Dates:* May 17 to June 14 (varies considerably). *Incubation:* Period 12 days (F. L. Burns) (Miss C. J. Stanwood), 13 days (O. W. Knight). Probably two or three broods yearly.

Range. — Northern and eastern North America. Breeds in Canadian and Transition zones from southern Yukon, southern Mackenzie, north-central Saskatchewan, central Manitoba, northern Ontario, south-central Quebec and southern Labrador south to south-central British Columbia, central Alberta, southern Saskatchewan, central-eastern North Dakota, central Minnesota, central Iowa (casually), southern Michigan, southeastern Ontario, southern Ohio (casually), southeastern New York (Long Island, locally) and in mountains to Pennsylvania and southern Maryland; west in migration to central North Dakota, central South Dakota, eastern Nebraska, eastern Kansas and Oklahoma; winters from

northwestern Arkansas, southeastern Missouri, southern Illinois, southern Kentucky, southern Pennsylvania, northern New Jersey, southeastern New York, northern Connecticut and Massachusetts (casually) south to southern Texas, southern Louisiana, southern Mississippi, southern Alabama and southern Florida; occasional in the Bermudas; accidental in northern New Mexico, in the state of Mexico (central Mexico), Heligoland, Germany and Belgium.

Distribution in New England. — Common to abundant migrant and summer resident throughout northern New England, the higher parts of western and central Massachusetts, Cape Cod and on Marthas Vineyard; in late years locally common summer resident throughout rest of Massachusetts and northwestern Connecticut; elsewhere in southern New England occurs as a rare local summer resident, but an abundant migrant in early spring and late autumn; winters casually in Maine and irregularly in Massachusetts, Rhode Island and Connecticut, chiefly along the coast.

Season in Massachusetts. — April 4 to November 24 (winter).

Haunts and Habits. When October comes with its clear, crisp, exhilarating weather, when fading leaves begin their brief flights through space, and squirrels scurry about garnering acorns and other delicacies on which to nibble during the long winter months, the Hermit Thrushes slip silently southward. Then we need not penetrate the heart of the woodland to find these celebrated anchorites of dim forest sanctuaries, but instead, during our country rambles we flush them, alone or in small groups, from wayside thickets, from orchards and coppices. And arriving home at our own garden plots we find these quiet, unobtrusive birds there also! At our approach, perhaps, a Hermit turns about and wings a silent retreat to the nearest covert, but another is just as likely to fly up to the low limb of a near-by tree or fence, where, regarding us with deep hazel eyes, it utters a low *chuck*, slowly tilting its tail. This is the manner in which the Hermit Thrush introduces and identifies itself to us.

Again in the early spring the Hermits are met with commonly for a few weeks, as they advance towards the northern forests with the hosts of other birds. These supposedly shy thrushes sometimes stop off even in the noisy city during their journeys to and from their breeding grounds. One early morning in April, just after awakening, I was surprised as well as intensely thrilled at hearing a suggestion of the mellow refrain of one of these thrushes issuing from the trees in a city alley-way near my window. In the Boston Public Garden, an oasis in the heart of the city, from one to ten or more Hermits can be seen nearly every day during the last three weeks of April and during October. Sometimes there is an "inundation" of them, as on April 19, 1928, when I counted at least thirty Hermits scattered over the lawns of the Garden and nervously flitting among the lower branches of the trees. The following day there were about twenty-five present, many of which, having found the Garden a safe place to feed and rest, put aside their timorousness, and hopped about the greensward as tame as the Robins, and not less dignified. Rarely do they sing while migrating, for they reserve their solemn lays for their summer haunts.

The Hermit Thrush is the hardiest member of the *Hylocichla* group, coming north a month earlier than any of the other thrushes, and departing south long after the last Graycheek has left our borders. While other thrushes are disporting in tropic glades and wil-

dernesses, the Hermit is reluctant to leave our eastern states, and is found during winter as far north as Massachusetts, but rarely beyond this state. In my experience this thrush seems to lose its natural timidity at this season, and assumes a more forward disposition, often coming to human dwellings for stray bits of food, when snow covers the ground. On February 27, 1927, I chanced upon a lone Hermit at Ipswich, Massachusetts, perched on a snow drift three feet high. Plump, tame and sociable, the bird looked me over with a calm, complacent air that was really amusing.

About fifty years ago the seclusive Hermit was found breeding in very limited numbers in Massachusetts, chiefly in the highlands of the western and central parts of the state and on Cape Cod. It was generally considered a rare bird, a typical recluse, and to be sought only in the deepest, most remote forests. But in comparatively recent years this bird has extended its breeding range and appears to be quite common, for we now enjoy its presence in many places where formerly it was never heard. During the summer months the Hermit is in full song within fifteen miles of Boston.

It is indeed strange that so exquisite a vocalist as the Hermit Thrush should have been but little known to the pioneers of American ornithology. Audubon and Wilson, evidently confusing this bird with the other species of thrushes, fell into extraordinary errors in their accounts of it, agreeing, for example, that this thrush is a summer resident in the southern states, and that its eggs are sprinkled with dark spots towards the end. Audubon states that it has no song! while Wilson, making some allowance for its singing, also says that in the spring it has "an occasional squeak like that of a young chicken." Nuttall gives the bird full credit for its musical talents, but repeats some of the errors of his contemporaries. Thoreau seems never to have had a clear conception of the vocal differences between the Wood and the Hermit Thrushes, and confused the two.

The ineffable charm and sweetness of the Hermit's song has been the inspiration of many a gifted writer. Poets have lauded it above all other North American birds, and its genius is declared by some to surpass even that of the Nightingale. Indeed, one of the names which the Hermit has earned is "American Nightingale." Mr. F. Schuyler Mathews describes its song as "the grand climax of all bird music," and says that "the passionate and plaintive notes of the Nightingale apparently have no place in the Hermit's song; our gifted Thrush sings more of the glory of life and less of its tragedy, more of the joy of heaven and less of the passion of earth." [1]

It is to the genius of John Burroughs that we owe this inspiring passage, so expressive of the mysterious, elevating character of the emotions with which the Hermit's song infuses us: "Mounting toward the upland again, I pause reverently as the hush and stillness of twilight comes upon the woods. It is the sweetest, ripest hour of the day. And as the Hermit's evening hymn goes up from the deep solitude below me, I experience that serene exaltation of sentiment of which music, literature and religion are but the faint types and symbols." [2]

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[1] Mathews, F. Schuyler: Field Book of Wild Birds and Their Music, 1904, pp. 235, 236.

[2] Burroughs, John: Wake-Robin, 1871, p. 75.

The Hermit pours out his soul in these tender, stirring hymns at all hours of the day and as Mr. Horace W. Wright observed, it outrivals the Robin in singing an hour before sunrise and a half hour after sunset. It sings from the time of its arrival at its breeding grounds until late August. The songs of the Hermit and Wood Thrushes bear such close similarity in quality that among the uninitiated it is always a matter of much difficulty to distinguish them. Ralph Hoffmann writes: "The song of the Wood Thrush begins with a phrase which suggests the syllables *ee-o-lee*, and continues with phrases, often containing notes separated by great intervals." [1] There are no great gaps in the Hermit's song, and as Mr. Hoffmann further points out, the song of the Wood Thrush contains bass notes, of which there are none in the Hermit's voice. Some authors are at variance as to which of the two thrushes excels in its vocal performances. The majority of bird-lovers of my acquaintance favor the Hermit Thrush over its rival. In many respects the song of the Hermit is usually the more remarkable of the two, both in variety of expression and in range of voice. Mr. Mathews, writing to Mr. Forbush under date of September 5, 1927, says that during the past forty years he has amassed a collection of one hundred and fifty songs of the Hermit Thrush, each of which is absolutely distinct from the other in musical composition.[2]

Professor Theodore Clarke Smith, recording his impressions of the song of a bird that came under his observation for over a month, writes: "The voice of the Hermit Thrush was made individual by over-tones giving it a considerable richness and penetration and even a metallic burr or buzz. It suggested somewhat the reed-quality of the oboe superadded to a flute's open tone. . . . The 'burr' was audible at short ranges only. At a hundred yards or less it blended to give a singularly ringing metallic quality which gave it a carrying power unapproached by any bird in that region (Lake Memphremagog). It should be said that in proportion as the bird seemed to be exerting himself, as for example on one occasion when suddenly joined by his mate, the metallic overtones were less prominent, and in certain of the key varieties they were nearly absent. The long opening notes were the freest, the high, rapid ones the most burdened with over-tones. At their worst the highest figures were occasionally almost squeaky, but in the full song they were by no means lacking in sweetness, and they were always clear and sharp. Heard from a very close range the long, full notes were fairly piercing, so sweet, full and vibrant were they. They were too loud for comfort, and when the bird suddenly began to sing while perched on a fence about ten feet from my tent it fairly made my ears ring." [3]

The Hermit has several distinct call notes, some of which have already been set forth in the technical description. In an intensive study of a pair of these thrushes, Mr. Norman McClintock was able to distinguish five kinds of notes, three of which will bear repetition here. One, which was uttered when the birds were in extreme distress, resembled the note of a "hoarse Canary" and sounded like the word "*boyb*, spoken slowly and with a rising inflection." Another was "a much used conversational note that evidently con-

[1] Hoffmann, Ralph: A Guide to the Birds of New England and Eastern New York, 1904, p. 75.
[2] Mathews, F. Schuyler: *in litt.*
[3] Ohio Naturalist, Vol. III, 1903, pp. 372, 373.

tained no implication of suspicion or trouble. . . . It was an exceedingly soft and sweet little note that could be heard but a few feet, and which I can best describe by *wee*. *Wee* was used by the parents to each other and to the young." The last, which he heard from the male bird twice only, was "an indescribable explosive twitter of ecstasy made with fluttering wings." It was first heard immediately after the male had been singing for four minutes, and on another day "it was uttered in the presence of the female, who was close by and towards whom it was directed." [1]

In selecting its nesting site the Hermit is partial to the proximity of bogs and swales and the sloping banks of brooks or streams, and evergreen woods seem to be a "necessary concomitant." Its habits are quite similar to those of the Olive-backed Thrush, with which it is often associated. The female chiefly is concerned with the care of the young, attending to most of the brooding and the greater part of the feeding. The Hermit does not use mud in constructing its domicile, after the manner of the Robin, but fashions it with moss and other material, into a deep cup-shaped structure, lined with pine needles. Miss Cordelia J. Stanwood tells of an interesting exception to this habit, where a nest that she found was lined with hair-cap moss (*Polytrichum commune*) and without pine needles, although it was built only three or four yards from a white pine.[2] In a careful study of a series of fifteen nests of this species, Miss Stanwood records that "seven nests were located in a knoll, two in a damp hollow, and six just above the swale in the dry earth of a hillside. In almost every case, the slight excavation for the foundation of the nest (which consisted of moss) was made in the loam of a decayed log or stump." From the results of her minute studies she was able to arrive at these conclusions: "The time of incubation . . . is twelve days; the young remain in the nest twelve days, and leave early in the morning, as a general thing. One egg is laid each day about ten o'clock in the morning, and the bird begins to incubate by twelve o'clock of the day the clutch is completed." Miss Stanwood's latest nesting date was August 22, 1909, when she flushed a Hermit from a nest with three eggs, which led her to judge that, like the Robin, the Hermit raises from two to three broods in a season.[3]

The Hermit Thrush is not strictly a ground nesting bird, for its nest has occasionally been found at various heights above the ground. One was located by Mr. Henry R. Carey five feet up in a small hemlock,[4] and another was found in an odd situation by Mr. Horace W. Wright, resting firmly on several bean poles four feet above the ground.[5] Dr. John B. May informs me that he once found what appeared to be a typical Robin's nest two feet up in a young hemlock, entirely different from the usual abode of the Hermit, but being used by a pair of these birds. This nest had a foundation of coarse grasses and weeds, a middle layer of mud, and a lining of fine dry grasses.

In exceptional cases, this forest recluse abandons the solitudes. Miss Annie L. Warner of Salem, Massachusetts, writing to Mr. Forbush on August 7, 1925, relates the find-

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[1] Auk, Vol. XXVII, 1910, pp. 413–415.
[2] Wilson Bulletin, Vol. XXVIII, 1916, p. 65.
[3] Bird-Lore, Vol. XII, 1910, pp. 101–103.
[4] Bird-Lore, Vol. XXVII, 1925, p. 226.
[5] Auk, Vol. XXXVII, 1920, p. 138.

ing of a Hermit's nest with two well-grown fledglings, about seven feet from the ground, on a shelf under the eaves of a piazza of an occupied camp on Lake Winnepesaukee. A still more remarkable instance where this bird completely forgot the implication of its name, is recorded by Mr. Edwin DeMeritte. A pair of Hermit Thrushes developed a friendly attachment for two lady occupants of a cottage on the shore of Asquam Lake, Holderness, New Hampshire, during the summer of 1919, following them about the cottage and responding to their calls and whistles. "Oftentimes the piano and singing brought the bird near, and when the music ceased the male burst forth into song." Late in July the mother bird was observed building two nests, about two feet apart, on a timber of the piazza. But suddenly she put a halt to her operations, and a few days later "she was discovered building another nest in the tin gutter under the eaves of the second story and under the tip of an overhanging oak branch. Here she completed her nest, laid her eggs and hatched her young, only one of which she raised as a deluge of water in a heavy shower drowned the others." [1]

During spring and summer the food of the Hermit Thrush consists principally of insects such as beetles, caterpillars and ants, with spiders and worms of various kinds. Its consumption of the predatory carabids is considered an unfortunate feature of its diet, but these beetles are taken only in small quantities. In the fall and winter the bird's food becomes mainly vegetal, consisting of a considerable amount of small fruit and a negligible proportion of seeds, including those of poison ivy, which, however, it does not destroy. Berries of the mountain ash, staghorn sumac and barberry are favorite items, while checkerberries, privet berries, dogwood and arrowwood berries, and even wild grapes and juniper berries are eaten, all in their season.

Economic Status. In an examination of the stomach contents of 68 specimens taken in California, Professor F. E. L. Beal showed that the Hermit's food was 56 per cent animal and 44 per cent vegetal. His summary of its economic status is here given: "On the whole, the food of the Hermit Thrush is remarkably free from useful products, destruction of which is a loss to mankind. The worst that can be said of the bird is that it eats and scatters the seed of poison oak, but does not do this to a marked degree." [2]

Planésticus migratórius migratorius (Linnæus). Robin.

Other names: AMERICAN ROBIN; ROBIN REDBREAST.

Plate 93.

Description. — Largest New England thrush; approaching Wood Thrush in form being thus less slender than the other Thrushes; wing long and ample with primaries cut away on outer web. *Adult male in breeding plumage:* Head black with three white spots, one before eye, one on upper eyelid and a larger one on lower eyelid; elsewhere above gray becoming darker or slaty on wing-coverts and flight-feathers which are edged with gray; some have black or blackish marks on back; tail slaty or sooty-

[1] Auk, Vol. XXXVII, 1920, p. 139.

[2] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 30, 1907, pp. 92, 93.

PLATE 93

PLATE 93

BLUEBIRD

Page 418

Adult Male

Adult Female

Juvenal Male

ROBIN

Page 406

Adult Male

Juvenal

Allan Brooks

black with narrow gray edgings, outer feathers tipped white on inner webs; chin white; throat streaked black and white; breast, sides, flanks and upper abdomen cinnamon-rufous or reddish-tawny; region of lower abdomen, vent and under tail-coverts white; iris brown; "bill and gape deep yellow, tip usually blackish; feet dark olive-brown, soles yellow" (Allan Brooks). *Adult male in winter plumage:* Similar to same in spring but tinged with olive above and reddish-brown under plumage tipped white; ridge of upper mandible black, rest horn-color and lower mandible tipped dusky. *Adult female in breeding plumage:* Similar to spring male, but usually duller, the gray above lighter and browner, dark part of head restricted and not so black; breast paler, its feathers partly edged whitish in summer. *Young in first winter plumage:* Similar to fall and winter adults of their respective sexes but browner above, head not so dark and the white spots on tail-feathers smaller. *Young in juvenal plumage:* Head, tail and wings resembling adults but top of head brown with narrow whitish shaft-streaks; back and lesser and middle wing-coverts brown with brown black-edged shaft-streaks; throat, breast and sides variably rufous spotted with black; "bill and feet dull pinkish-buff, becoming dusky" (J. Dwight).

Measurements. — Length 9.00 to 10.75 in.; spread 14.80 to 16.50; folded wing 4.90 to 5.50; tail 3.75 to 4.75; bill .80 to .94; tarsus 1.00 to 1.40. Female usually but not always smaller than male.

Molts. — Similar to those of thrushes of the genus *Hylocichla* (see page 387) except that the post-juvenal molt involves all wing-coverts and tertials, this molt usually beginning in late August and extending through September and part of October. Adults sometimes begin molting in late July.

Field Marks. — Anybody who knows any American birds will recognize the black-headed gray-backed red-breasted Robin when in full plumage. Juvenal birds are similar but duller, with blackish spots above and below.

Voice. — Alarm note, a *chirp* varied in pitch and volume from soft and rather low to high and shrill; a shrill squeal or scream when in great fear; a thin lisping note much like that of Cedar Waxwing. Calls, "a soft, ventriloquistic *kwce-kwec-kuk* or *kwce-kwce-kuk-kuk-kuk;* a sharp, clear, high, sparrow-like *chiepp;* a short *tut-tut*, with a jerk of the tail; rapid, rather explosive *puck-puck-puck-puck-puck*, with a jerk of the tail at each syllable; *skeek-skeek;* a clear *tee-urp*" (G. F. Simmons); "*wicky, wicky, wicky*" (O. W. Knight); also very low conversational chattering, chuckling, etc. Song, a loud carol, sometimes rendered *cheer-up cheer cheer cheer-up;* sometimes *cheerily cheer-up cheerily cheer-up,* often going on indefinitely with variations; also "a low, softly uttered, ventriloquial song" (O. W. Knight).

Breeding. — Anywhere, in forests or open lands, farm lands, villages or even in cities. *Nest:* Commonly in forest, shade or orchard tree, less commonly inside building, in some recess or nook on building, bridge, wagon, car or boat, on top of stump, post, fence, telephone pole or sawed-off top of tree, in stone wall, bush, in hollow tree, in or on bird house or even on ground; from ground to 70 feet up, commonly rather low; a large rather deep cup built of twigs and grass with a strong inner bottom and walls of mud, lined usually with fine grass, but almost any fibrous material such as seaweed, cloth, string, yarn, cotton or paper may be used. *Eggs:* 3 to 5, usually 4, very rarely 6; 1.05 to 1.26 by .78 to .85 in.; commonly ovate to elongate ovate; greenish-blue, very rarely marked with faint spots of reddish-brown; figured by E. A. Capen in "Oölogy of New England," Plate I, Fig. 1. *Dates:* April 17 to July, Rhode Island; April 12 to July 25, Massachusetts; April 28 to early August, Maine. *Incubation:* Period 11 to 14 days; sometimes by both sexes but usually chiefly by female. Two or three broods yearly.

Range. — North America to northern Mexico. Breeds in Hudsonian, Canadian, Transition and Upper Austral zones from limit of trees in northwestern Alaska, northern Yukon, northern Mackenzie, northern Manitoba, northern Ontario, northern Ungava (Quebec), northern Labrador and Newfoundland south to the Pacific coast at Cook Inlet (Alaska), northern British Columbia, central Alberta, northern and eastern North Dakota, Kansas, northern Arkansas, central Illinois, Indiana, Ohio, Pennsylvania, New Jersey and in the Alleghanies to eastern Kentucky; winters from southeastern South Dakota, southern Minnesota, southern Wisconsin, northern Michigan, southeastern Ontario, southeastern New York, central Vermont, southern New Hampshire, southern Maine, New Brunswick, Nova Scotia and (rarely) Newfoundland to Nuevo Leon (Mexico), southern Texas, southern Louisiana, southern Alabama and

southern Florida; casual in the Bermuda Islands; accidental in southwestern Greenland, Cuba, Great Britain, Austria and Germany.

Distribution in New England. — Common summer resident; common migrant; less common to rare winter resident, probably very rarely if ever wintering in northern Maine.

Season in Massachusetts. — Resident, but most abundant from late April to October.

Haunts and Habits. On every vernal morning a wave of Robin song rises on the Atlantic coast to hail the coming day, and so, preceding the rising sun, rolls across the land until at last it breaks and dies away upon the distant shores of the Pacific Ocean. All through the northern states the Robin ushers in the day with song. Hot or cold, wet or dry, the Robin sings. He makes himself at home in the back yard; he hops about on the lawn; he knows all the folks and they all know him. Why then should one write about his haunts and habits, which should be well known to everybody? In answer to this it may be said in truth that most people really know very little about him.

To begin with he is not a robin and never was one. The real "Robin Red-breast" is a native of the Old World — a little bird formed much like our Bluebird with a dark brown back and a reddish-orange throat and breast. This is the Robin that appears so often in European literature and folk-lore — the one that covered with leaves the "Babes in the Wood." Our so-called Robin is a large migratory thrush with a reddish-brown or tawny breast, but our forefathers named him Robin in remembrance of the beloved English bird and despite the protests of naturalists the name sticks.

Another thing about this bird that most people do not know is that many Robins spend the entire winter in New England, where they roost among the evergreens in swamps, feed on winter berries and come out into the fields occasionally when the snow has vanished during a thaw. This common habit is so little known that nearly every winter the newspapers publish articles predicting an early spring because the "first Robin" has appeared or because "the Robins have arrived early." In some winters when persistent berries are abundant in the north hundreds of Robins pass the winter in New Brunswick and Nova Scotia as they did in the winter of 1924–25, but this is unusual. In January, 1929, Robins were reported as wintering even in Newfoundland. Most of our Robins, however, go south in winter and probably all those that winter in New England are hardy birds that nest in Ungava, Labrador and other northern regions and even some of these perish of privation and cold in severe New England winters.

The New England breeding birds go south and in severe seasons many of them go to the extreme tip of the peninsula of Florida. Large flights sometimes reach Key West. In Brevard County, Florida, I have seen Robins in one continuous stream crossing the sky from horizon to horizon for an entire forenoon, all traveling southward and in the afternoon many were seen retracing their flight. There they feed much on palmetto berries in winter. They seem to have no particular destination in the south but wander about, stopping where food is plentiful as was the case with the Passenger Pigeon and like the pigeons they roost in immense numbers in favorite places. In the winter of 1927–28 there was a roost in North Carolina which harbored a vast assemblage of Robins esti-

mated at three million birds by one of the game wardens (a probable exaggeration, however). There are similar roosting places in Tennessee and Kentucky where some of our birds doubtless go in winter. A Robin banded in Massachusetts in summer was taken in Kentucky in the winter.

How Robins formerly were slaughtered in their southern roosting places is told graphically by Dr. T. Gilbert Pearson. The birds were killed for food and were sold in the market. Dr. Pearson says that as late as 1913 he saw strings of them offered in the markets of Raleigh, North Carolina, at 60 cents a dozen. He quotes Dr. P. P. Claxton, United States Commissioner for Education, who tells how a Robin roost near Fosterville, Tennessee, was raided by the inhabitants. The birds roosted in thick cedar woods and came many miles from all directions to congregate there at night. In the words of the narrator "the trees . . . for a mile square were literally loaded at night with Robins." When a party of hunters arrived at the roost at night one of them with a torch climbed a tree and when the torch was lighted the others with poles beat the surrounding trees. Blinded by the light the suddenly awakened birds flew to the light, and the torch bearer seizing each one, quickly pulled off its head and dropped the body into a bag hanging from his shoulder. Thus three or four hundred birds were captured by one man in a single night. This tremendous slaughter continued for three or four winters, after which the birds abandoned the roost.[1] Now the sale of the birds is illegal and they are protected by law, but many are still killed by law-breakers both north and south.

Naturally, therefore, Robins become very wild in winter, but when they return to their old homes in New England in spring they seem to know that they are among friends and soon become exceedingly tame. Often they seem to value human friendship. A male that nested in a tree near my garden was accustomed to follow me about keeping close to my heels as I pushed the cultivator or handled the hoe. He picked up grubs and worms dislodged by my implements. Whenever I tossed him a grub the motion did not disturb him at all — he came and took it. My friend the Reverend William R. Lord, author of "The Birds of Oregon," had a Robin on his place that continually followed him about the yard though he never fed it. The bird seemed to be particularly interested in his conversation and so long as he talked to it in a low confidential tone, it followed him about the neighborhood and even along the street.

Apparently the northward movement of Robins begins before spring opens. Not infrequently Robins appear in considerable numbers in January. Large flocks have been seen at that season in Maine and many in Nova Scotia, but we cannot assume that such birds are on their way north. More likely they are late migrants from the north or from the interior; but in late February and early March there is evident some northward movement. The early birds are endangered by severe northerly storms with high winds and snow and sometimes many of them are driven back to the coast of Connecticut, as was the case in late March, 1919, when many that remained in western Massachusetts died during a severe storm with deep snow, that followed close upon a warm wave. Even

[1] National Association of Audubon Societies, Educational Leaflet No. 46, 1910.

in April snow sometimes overtakes them among the hills of western Massachusetts. Mrs. Elizabeth Caswell watched some Robins that met a gale and snow in early April, 1918, near Orange, Massachusetts. "At night," she says, "they squatted on the ground" in the lee of a barberry hedge and let the snowfall cover them there. Mrs. Caswell was up before daybreak and saw the birds rouse themselves in the morning light, shake off the snow, fly up into the hedge and feed on the berries.

On bright warm mornings in early spring the Robins sing their well-known carols. The songs vary considerably; the meter and rhythm of one song is imitated by the well-known words *kill'em, cure'em, give'em physic.* Later, in the season of summer showers, the more copious "rain song" is given. Now and then a Robin appears to imitate some other sound beside his own. Thus, one may render the song of the Blue-headed Vireo, another whistles like a boy calling a dog, but in most cases the Robin adheres closely to his own characteristic but somewhat varied repertoire.

As spring advances the Robins begin their wooing. Everybody in the rural districts whose eyes and ears serve them, has seen it, for it is by no means carried on in private. The pursuit, the battles of the jealous rival males and the apparent lack of interest shown by the demure females, are apparent to all. Courtship often begins while some snowbanks still remain in shady places and while morning temperatures are below the freezing point. Mrs. E. S. Fowler of Danvers, Massachusetts, wrote on April 13, 1913, that she saw a male bird with a worm start in the direction of a female sitting by a snowbank, when he saw another male with her and with a loud cry drove the interloper around the corner of the house, but as he turned the corner in hot pursuit a gust of the April breeze caught him sidewise, whirled him about and drove him back over a strip of ice that gave him no footing, though his feet moved rapidly in the effort to overtake his rival. When the gust finally dropped him he seemed a bit confused. Then he looked to his female only to find that his rival, who had flown over the house and back to the trysting place, was with her again. With a shrill scream of rage the baffled suitor dropped his worm and flew at his rival with open mouth, driving him from the vicinity.

Probably the female usually chooses the nesting site but sometimes the male is insistent on his own choice. Mr. P. L. Marden of Weymouth, Massachusetts, says that a male Robin tried to persuade a female to occupy his last year's nest, even going so far as to bring material himself and begin repairing the old home, but she would have none of it, and built a nest in a cedar tree farther away from the house.

When a pair of Robins have chosen their nesting place for the season, the male drives off other Robins that encroach on his domain. If one of them comes close to a house and sees his reflection in a cellar window he is likely to fly at it and to continue to attack it day after day. In some cases where the nest is on the building or on a branch near it the male attacks his image in an upper window and continues to do so intermittently for weeks. Thus we hear sometimes of "crazy" Robins. Then occasionally a Robin has what seems like a mania for nest building. One season a Robin built three nests over

my cottage door and as many as ten nests or partial nests have been built by one bird in a season on some beam of an out-building.

In nest building Robins normally use mud yet I found a nest once without a particle of mud in its composition. It was on the ground at the foot of a sandbank and sunk in the ground like the nest of the Song Sparrow. In this case no mud was needed. Nevertheless in two other nests that were built on the ground the usual mud cup was used, but these nests were set on top of the ground and not let into it. Occasionally in a dry time and in a locality where mud is unobtainable a Robin builds a nest without it. Some kind-hearted people at such a time supply the birds with a pan of wet clay, and they are not slow to take advantage of it. Sometimes Robins are ingenious enough to adopt some method of making mud. One went into the water and wet her feathers and then shook off the water in the dust of the road. Another filled her mouth with dry earth and then dipped her bill in a bird bath.

In building the nest the Robin prefers to incorporate the coarser straw while it is wet with rain or dew. Mr. Charles J. Anderson of Springfield, Massachusetts, watched a Robin pick up straw, fly to the bird bath and soak it, then carry it to the nest and shape it. She continued to do this until the nest was finished. Often after the mud cup of an April nest is finished, from four to seven days elapse before the lining is put in and in rainy weather long delays occur before the nest is completed, probably to give the mud time to harden. In fact these copious early rains sometimes wash more or less mud away so that the nest must be rebuilt more than once, but in the warmer, drier weather, when the nest for the second brood is built, it is begun, completed and dried out ready for the eggs in from two to three days.

Usually the nest is built chiefly or entirely by the female, who sometimes sits in it as if to enjoy it and rest. In building she uses both bill and feet at the same time, working the lining into place on one side with her feet and smoothing the edge on the other side with her bill and throat. She smooths and shapes the lining also with her breast. Now and then a male gives his mate considerable assistance. Occasionally the construction of the nest may be delayed so that there is no time to line it. At least that seems to be the case when we find eggs laid on the mud with no lining. Mr. E. M. S. Dale writes from Ontario on June 5, 1927, that a Robin came to a basin left outside a window, took a drink and then laid an egg near-by on the grass. "If the lady who put out the basin could but train the neighbor's hens to do that it would be a paying proposition" says Mr. Dale. Very likely the nest of this Robin had been destroyed. In such a case a Robin has been known to deposit an egg or two in the nest of another bird.

Robins will use almost any pliable, fibrous material for nesting purposes. I once supplied a pair with cotton batting, which, barring mud, was almost the only material used in building their nest. When finished the nest looked like a patch of snow on the high fork of a limb in a dark pine tree. Miss Lucia B. Cutter of Jaffrey, New Hamsphire, says that a friend put out a collection of white and colored strings for the birds. The Robins took only white strings ignoring the colored ones.

Usually while the female is building the nest and incubating her eggs the male stands guard, feeding her occasionally. Often when the female leaves the nest the male comes and keeps watch near-by if not on the nest. Some males, however, insist on doing their share of the incubating and brooding, and some probably would do more if the females would allow them. Mrs. Elizabeth L. Burbank of Sandwich, Massachusetts, says that a male Robin has acted in a peculiar manner for two seasons. While the female sits closely on her nest he often repairs to a certain spot in the grass where he can look up at his mate in the nest and there sits as if on a nest, acting like an incubating bird, fluffing out his feathers, rising up and seeming to turn eggs at times; and this happens day after day. Doubtless this bird had been mated with another female in the past and had been accustomed to relieve her on the nest. Probably it is the same male that acted in the same way the previous year, as a Robin with one leg has been known to return to the same place to nest for five successive years and other Robins have been known to return and use the same nest year after year, usually repairing and refitting it each year, though nests in protected situations have been used a second time without repairing.

Ordinarily the male does his full share of feeding and protecting the young and he takes care of the first brood after the female has started the second. Both parents are extremely devoted to their young. During a sudden severe downpour of rain a mother Robin sheltering her well-grown young on the nest was heard to give a piercing cry as she was unable alone to protect them fully from the flood. Her cry brought her mate, when the two perched on opposite sides of the nest, breasts pressed together and heads crossed by each other, their bodies and wings thus sheltering the young like a pitched roof, while the rain ran harmlessly off on both sides.

Mrs. D. H. Harrington of Orange, Massachusetts, tells of a case where one of the parent birds with young to feed was killed and the other had a wing so injured that it could not fly. The nest was built on the first limb of a tree and the bird leaving its nest hopped down on the lawn, hunted for worms and grubs, then hopped and scrambled up the leaning trunk to the branch and so continued to feed and brood its young until they were ready to leave the nest, when, the hurt wing having healed in the meantime, they all flew away together. In another case a male bird caring for his first brood suffered (apparently) from a broken leg but continued on one foot to care for and feed the fledglings.

The Robin is looked upon generally as a model of fidelity, constancy and devotion to one mate. The following case may be one of the few exceptions which proves the rule. Reverend George E. Allen of Plainfield, Massachusetts, banded a female Robin which was feeding a brood of three young; a male bird which assisted her was also banded. On June 8, her young left the nest. She had already started a new nest and there were three eggs in that by the 13th. While feeding the young in the nest she was assisted by an unbanded male and also by an unbanded female, which also fed one of the immature banded birds of the first brood. The second brood left the nest on July 10; on the 14th the banded female was refitting the second nest in which three eggs were found July 25. Was this bigamy?

Dr. and Mrs. E. W. Victor, writing from Orford, New Hampshire, in 1923, stated that a Robin family there consisted of one male and two females. One bird was always waiting to take its place on the nest as soon as the other left it. When this was first noted there were five eggs in the nest. Then it was noticed that both females were attempting to incubate at the same time; first one sat on the back of the other but finally crowded in alongside of her; two days later eight eggs were found in the nest. No fourth Robin was seen about it. One egg was stolen later, one proved infertile and the rest hatched. One fledgling fell out of the nest and early in the morning four days later some marauder took them all. A little later both females were seen to fly to the nest with food in their bills but the nest was empty.

The bravery of Robins in defense of their young is well-known. Mr. Henry W. Abbott of Yarmouthport, Massachusetts, says that he was once assaulted by six adult robins with berserker rage and feathered fury. The late Judge George W. Wiggin, formerly secretary of the Massachusetts Fish and Game Protective Association, said that one morning in June he saw a gray squirrel start to climb an oak tree in which a female Robin was brooding young in the nest. Immediately the male Robin appeared, followed by six or eight more, all of whom darted at that squirrel and pecked it until they had driven it out of the tree, over the lawn, and across the street. In defense of its young one Robin has been seen to put two Blue Jays to flight. Some Robins are very pugnacious during the breeding season and such individuals have been known to kill other birds, though possibly for good reasons.

Now and then a Robin, lacking young of its own, adopts the young of some other bird and cares for them as if they were its own. A Robin at Montpelier, Vermont, began to feed a small chicken that had been lost or deserted by its young and inexperienced mother. First it brought a worm and tried to put it into the chicken's mouth, failing in this it dropped the worm in front of the chicken, which promptly picked it up. This seemed to please the Robin, so it continued to bring worms and bugs. A pair of Robins having lost their own young began feeding some young Song Sparrows, much to the disgust of the real parents. Two Robins crippled and confined, amused themselves by feeding orphaned young Robins that were confined with them.

As soon as young Robins leave the nest they are exposed to manifold dangers, and cats get a very large proportion of them. Many Robins' nests are built in trees along river banks on branches overhanging the water and young birds in their first flight not infrequently land in the water where they may become the prey of large fish, turtles or frogs. They do not remain long in the water if they escape these dangers, for the mother bird calls from the shore and the little ones flutter and scramble over the surface until they reach her.

Some late broods of Robins are not out of the nest until September. Mr. Adelbert Temple of Hopkinton, Massachusetts, records a brood that occupied the nest until September 13th. Robins are very fond of bathing and the young birds begin to bathe soon after they leave the nest, and while in their juvenal dress; after the bath some of them find

a secluded warm and sunny place and lie in the sun to dry, usually on one side with partly spread wings and tail. I have a photograph of one in that position. When the first brood leaves the nest they are guarded and fed by both parents, but soon the mother bird leaves them to be cared for by her mate and prepares for another brood. In some cases the fledglings return to the nest for a few nights to sleep, other broods never return to it. The young birds do not at once learn to feed themselves, but follow the male about with plaintive cries as if famishing. One day a male bird apparently became impatient with the importunities of a helpless fluttering young one almost as large as himself, and seizing a piece of cotton that had lodged in a bush, stuffed it into the mouth of the youngster to keep it quiet.

Undoubtedly the calls of birds have a meaning which all of them recognize. Mr. Warren A. Phelps of Pittsfield, Massachusetts, watched a male Robin feeding a young one in the garden. Suddenly the old bird flew to a perch and uttered an alarm note as some noisy children came up from another street, passing near the garden. At the call the young bird stopped and stood still under the shelter of the rhubarb until the children had passed. A little later a cat came around the corner of the house. The father bird immediately gave a different call and the young bird promptly flew up to a higher perch.

Robins not only resort to community roosting places in winter, but also establish summer roosts to which some of the old males begin to go nightly even in June. In July they are joined by young birds of the first brood, and when the last brood has been reared, old and young, male and female, all resort to the roost at night. The numbers at these roosts increase greatly in August and thousands of Robins continue to occupy these roosts nightly until the middle of September, when their southward migration begins. Torrey and Brewster have given quite full accounts of these roosts.*

I can add nothing to the well-known accounts of these gentlemen except the following item. Mr. Brewster says that he has never known Robins to spend the night in pines or in any species of evergreens except in a white cedar swamp at Falmouth, Massachusetts. My pine grove comprising about six acres of white pine at Wareham, Massachusetts, was a robin roost for about ten years and was the resort each summer of at least a thousand Robins. They came to it nightly from all directions. Whenever any one with a lantern passed through the grove at night the birds could be heard fluttering all through the tops of the trees.

As soon as the last brood of young has been reared, the Robins change both haunts and habits. They assemble in flocks and range over the country, searching for wild cherries and wild berries on which they subsist for the rest of the year. When the wild cherries, wild grapes and mountain ash berries are gone they feed on berries of the red cedar or Virginia juniper, bayberry, bittersweet, buckthorn, etc., or move on to the south.

What American bird is as adaptable as the Robin? Normally a bird of the great primeval forests, it has seen them disappear but it still remains. As trees have been

* See Torrey, Bradford: Atlantic Monthly, Vol. LXVI, 1890, pp. 492–498, and Brewster, William: Auk, Vol. VII, 1890, pp. 360–373.

planted on the prairie it has extended its range over the whole country and where there are no trees it nests in bushes, on stone walls, in buildings or on fences, or even in some cases on the ground. Trustful in a wisely discriminating way, it comes into our yards and builds its nests in fruit gardens and even in sheds and out-buildings, ever watchful and alert for prowling cats. It penetrates into the cities and even raises its young in street trees and city parks.

As for food, there is hardly a wild fruit of any kind produced in the north that Robins do not eat, swallowing pits and seeds of the smaller fruit with the pulp and ejecting the undigested parts through the mouth. They thus become distributors and planters of nearly all our wild fruits — which need such agencies to scatter them widely so that not all will be found beneath the trees by those animals which feed upon the seeds. Professor F. E. L. Beal says analyses show that the food of the Robin consists of 42.40 per cent animal matter and 57.60 per cent vegetal. Thus it will be seen that its percentage of vegetal food is larger than that of any other New England thrush. This vegetal matter is mainly fruit, which constitutes over 50 per cent of the entire aliment for the year, but more than four-fifths of this is wild fruit. In the wilderness the fruit taken is from wild plants but in farming regions, especially where clean and intensive cultivation gives little room for wild fruit, Robins take a heavy toll from the cultivated varieties, chiefly from cherries and other small fruits, though pears sometimes are pecked into and occasionally clusters of grapes are seriously damaged. Robins also eat a few seeds, including a little waste grain, but probably mainly such as is soaked and softened by water. Their animal food consists chiefly of insects — among them some of the greatest pests of the farm, garden, orchard and forest. To enumerate a few — grasshoppers, locusts, crickets, wireworms, May beetles and white grubs, rose-beetles, leaf-beetles, leaf-miners, weevils, borers, a host of caterpillars both hairless and hairy including the tent, forest tent, gipsy, brown-tail and spiny elm caterpillars, tussock moths, cut-worms, army-worms, the larvæ of the codling moth, ants, cicadas, plant-bugs, tree-hoppers and saw-fly larvæ. In addition to their insect food Robins eat earthworms, thousand-legs and snails. They also kill and eat or feed to their young very small snakes and occasionally one has been known to master and kill one over a foot in length, which of course the bird could not eat. Small larvæ of aquatic insects are taken from the water with an occasional leech and Robins not infrequently do considerable damage in fish hatcheries by catching fish fry or very young fish.

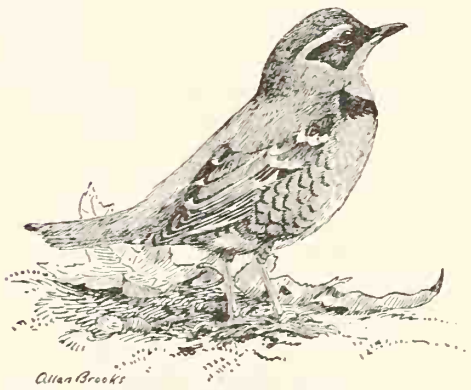
People often ask whether there is any food that they can feed to Robins in time of need, especially in unseasonable snow-storms in early spring. Robins at such times may be induced to eat cottage cheese or ordinary curds. Some people gather elderberries and sumac berries in the autumn for this purpose. Cooked spaghetti was accepted by one Robin. The food should be placed on some natural object such as a rock or a log or on the ground.

Economic Status. Outside of the injury done by the Robin to small fruits it may be considered generally as a beneficial bird. Its injury to small fruits, especially to cher-

ries, which in New England suffer most from its depredations, may be minimized by planting on the edge of the orchard a row of soft early cherries, or better still, a row of early-bearing mulberries such as the Charles Downing or New American. The birds are attracted to these and generally leave the harder, more marketable cherries alone. They should be planted when the other trees are set out, or before, that they may come into bearing as soon as any in the orchard. The mulberries have a long fruiting season and if the harder, more marketable cherries are planted for a crop, there will be little trouble from birds. When I lived in Medford I had a row of mulberry trees and some black-heart cherries. The cherries were never appreciably damaged by birds. In Wareham I had but one mulberry tree, which never bore fruit, and half a dozen cherry trees. There the birds got all the fruit and we never got a cherry. At one time I went to New Jersey to speak on the "Utility of Birds," in the State House. An attempt had been made by fruit growers to have the protection of the law removed from the Robin. Several fruit growers who had planted mulberry trees testified that they had no trouble from the bird while those who had planted none were anxious to exterminate the Robins.

Ixóreus nævius nævius (Gmelin). Varied Thrush.

Description. — Form resembling Robin; bill much shorter than head, without obvious notch at tip; nostrils mostly covered by short, dense feathers; bristles about mouth rather weak and slender; wing rather long and pointed, the longest three primaries with outer web sinuated; tail much shorter than wing; basal part of middle toe joined for more than half its length to outer toe. *Adult male in breeding plumage:* Above slaty; streak beginning over eye (including eyelid) along side of head to neck, two broad wing-bars, part of edges of flight-feathers and lower plumage generally orange-brown, tawny-ochraceous or ochraceous-buff, becoming paler on under tail-coverts and broken by gray feather-tips on sides and flanks; middle of abdomen white; sides of head chiefly black or slaty-black connected by a slaty stripe down side of neck with a broad slaty-blackish band across upper breast; wings crossed by a broad band of white on inner webs (not visible on closed wing); "bill black, pale at base below; feet purplish-flesh-color, soles bright yellow" (Allan Brooks). *Adult male in winter plumage:* Similar to same in breeding plumage, but usually showing indistinct olive feather-margins above. *Adult female:* Much duller in color and more olivaceous than male; above very similar in coloration to common Robin in winter, the wings and tail perhaps a trifle darker; breast-band same color as back or somewhat lighter; elsewhere below paler than in male. *Young in first winter plumage:* Resemble adults of their respective sexes; in male the colors are not quite so deep and the breast-band narrower than in adult; the female browner than adult, sometimes with hardly a trace of the breast-band. *Young in juvenal plumage:* Resemble closely adult female.



Varied Thrush, Adult.

Measurements. — Length 9.00 to 10.00 in.; spread 15.00 to 16.00; folded wing about 5.00; tail 3.70 to 3.90; bill .91 to 1.02; tarsus about 1.25. Female usually smaller than male.

Molts. — Similar to those of other thrushes, but the coverts are the only wing-feathers shed at the postjuvenal molt.

Field Marks. — Size, slightly smaller than Robin. Adult male slaty above, orange-brown, rusty or tawny below, with a stripe over eye and two wing-bars of shade similar to lower plumage; sides of head black connected by a blackish line or stripe *with a dark band across upper breast, the most conspicuous mark on the bird.* Female and young much duller in color but similarly marked, usually showing a dark breast-band. In both sexes and all ages, a white bar in wing shows in flight.

Voice. — "Call note, a single, not loud, deep, staccato *chuck;* song, a slowly uttered series of weird syllables, successively on different pitches, now low, now high; each note intoned from one to three seconds: *zurrrrr*" (Grinnell and Storer); song, five or six notes in a minor key and on a regularly descending scale (J. G. Cooper); "it is without modulation — a single sweetly penetrating note with just the slightest gurgling rattle in quality, and pitched in various keys. It may be represented thus: *brrrrrrrrrrr!*" (Charles Keeler).

Breeding. — In northern spruce forests, often among deciduous bushes or coniferous trees near water. *Nest:* Low in bush or on pile of driftwood or in tree up to 25 feet or higher; composed of twigs, stems, leaves, mud, grasses, moss, lichens, etc., and lined with fine grasses; resembling that of Robin. *Eggs:* 4 or 5; 1.10 to 1.15 by .78 to .88 in.; ovate; bluish-green or greenish-blue spotted and blotched with dark umber-brown.

Range. — Pacific Coast. Breeds in Canadian and upper Transition zones from Yakutat Bay, Alaska, south to Humboldt County, California; winters from extreme southern Alaska south to Colorado River in southern California; accidental in Kansas, New Jersey, New York, Massachusetts, Quebec and Guadalupe Island.

Distribution in New England. — Accidental visitor. Record: *Massachusetts:* Ipswich, December, 1864, bird shot by J. M. Bethune, sent to the collection of the Boston Society of Natural History.[1]

Haunts and Habits. The Varied Thrush is evidently a Robin in a different dress. It appears much like a Robin, and has similar habits and actions. Normally it is a bird of the great northern coniferous forests or high mountain forests of the far west and is only a straggler in the east. My good friend the late Louis Agassiz Fuertes gave the best description of its song that I have seen. He described it as "most unique and mysterious," and said that it "may be heard in the deep still spruce forests for a great distance, being very loud and wonderfully penetrating. It is a single long-drawn note uttered in several different keys, some of the high-pitched ones with a strong vibrant trill. Each note grows out of nothing, swells to a full tone, and then fades away to nothing until one is carried away with the mysterious song. When heard nearby, as is seldom possible, the pure yet resonant quality of the note makes one thrill with a strange feeling, and is as perfectly the voice of the cool, dark, peaceful solitude which the bird chooses for its home as could be imagined. The Hermit Thrush himself is no more serene than this wild dweller in the western spruce forests."[2] This is a brave and hardy bird but shy and wild.

Analysis of its food shows that about one-fourth is animal matter and three-fourths vegetal.

Economic Status. As this is chiefly a forest bird it is of no economic importance outside the forest.

[1] Coues, Elliott: Proceedings, Essex Institute, Vol. V, 1866–7 (1866–8), p. 312.

[2] Bailey, F. M.: Handbook of Birds of Western United States, 1902, p. 174.

Œnánthe œnánthe leucórhoa (Gmelin). Greenland Wheatear.

Note. The Greenland Wheatear is a bird of most unusual and interesting range. While its principal breeding grounds are in the Western Hemisphere, it winters in the Old World, the only small land bird which has such a distribution. Evidently the species originated in the Eastern Hemisphere and our race still breeds in Iceland, but it has extended its nesting area to Greenland, Ellesmere Land, Boothia Peninsula and northern Ungava, and there is even evidence that it has bred near Godbout in Canadian Labrador. Instead of migrating south in autumn along the coast of North America, it travels back over its old ancestral route, visiting the British Isles, France, Holland and Germany, to spend the winter in western Africa. Occasionally individuals straggle to points in Canada and farther south and the bird has been recorded from Keewatin, Ontario, Quebec, New Brunswick, New York, Louisiana, Bermuda and Cuba.

There were formerly two alleged records of this subspecies for Maine; one a bird taken by G. A. Boardman at Grand Manan, the other a bird taken at Indian Head near Eastport, Maine, but both these birds were taken in New Brunswick on the wrong side of the international border. On September 17, 1910, Mr. Charles R. Lamb saw a bird at Pigeon Cove, Gloucester, Massachusetts, which he is certain was a Greenland Wheatear, but he did not secure the bird.[1] Since then we have received reports of several other specimens seen on the Massachusetts coast by careful observers, the latest report being that of a bird observed by Mr. John Conkey at Nahant on January 27, 1929.[2] The Greenland Wheatear is so conspicuously marked that no one having any knowledge of the bird could fail to recognize it if given a fair opportunity, but until we have a specimen actually taken and identified, we can hardly accept this race as a New England bird.

Siália síalis sialis (Linnæus). Bluebird.

Plate 93.

Description. — A small thrush-like bird with rather slender short bill, wide at base; long pointed wings; shorter but ample, even tail; and rather short legs. *Adult male in breeding plumage:* Bright blue above extending over sides of head, chin and sides of upper throat and most of wings and tail, becoming slightly lighter and grayer on sides of head, chin and throat, becoming gradually blackish on ends of flight-feathers; most of throat, breast, sides and flanks chestnut-brown, rest of under plumage white, under tail-coverts more or less tinged pale grayish-blue; axillars and under wing-coverts pale grayish-blue; iris brown, "bill and feet black, mouth yellow" (Allan Brooks). *Adult male in winter plumage:* Similar to same in spring but blue slightly duller and more or less obscured above by brownish tips; tertials edged whitish; breast, etc., tinged slightly with purplish or vinaceous. *Adult female in breeding plumage:* Similar to adult male in distribution of colors but paler and duller, more grayish-blue above tinged with brownish, becoming brighter, more blue on rump, upper tail-coverts and tail; pale dull cinnamon-brown on lower throat, breast, sides and flanks. *Adult female in winter plumage:* Similar but with stronger brown tinge above and brighter brown below; greater coverts, secondaries and tertials with pale whitish edges. *Young in first winter plumage:* Similar to adults of their respective sexes in fall and winter but colors not quite so deep and rich; young male also has tertials edged with whitish or rufous. *Young male in juvenal plumage:* Above slaty-mouse-gray spotted on back and lesser and middle wing-coverts with white or whitish spots bordered with dusky; crown and rump grayer and without spots; greater wing-coverts, flight-feathers and tail dull blue, with pale or white or rufous edgings; below dirty or brownish-white with dusky edgings giving a streaked or spotted effect. *Young female in juvenal plum-*

[1] Auk, Vol. XXIX, 1912, pp. 250, 251.

[2] Conkey, John: *in litt.*

age: Similar to young male in same plumage but blue above not so bright and dark markings below heavier.

Measurements. — Length 6.30 to 7.70 in.; spread 11.40 to 13.25; folded wing 3.75 to 4.20; tail 2.60 to 3.15; bill .56 to .68; tarsus .70 to .82. Female smaller than male.

Molts. — Juvenal plumage acquired by complete postnatal molt; first winter plumage by partial postjuvenal molt (August, September) involving body plumage, wing-coverts, tertials and tail; first breeding plumage by wear; adult winter plumage by complete postnuptial molt (August, September); adults have but one molt annually (postnuptial) and acquire breeding plumage by wear as in young bird.

Field Marks. — The only bluebird in New England having a reddish-brown breast; female, much paler and duller than male. Juvenal young are spotted above and below, only the wings and tail showing any blue. Male has a habit of fluttering by flirting up tip of wing, especially after alighting.

Voice. — Call note, *cher-weé* or *turweé;* alarm note, a peculiar chatter; song, a soft *cheuery cheuery* often repeated; not confined to the male as some females are singers.

Breeding. — In edges of woods, orchards, gardens and yards. *Nest:* In hollow limb, hole in trunk, deserted woodpecker's nest, nesting box or bird house; from 3 to 30 feet up; composed chiefly of grass, but often with leaves, rootlets, fine twigs and hair or a few feathers. *Eggs:* 3 to 7, usually 4 or 5;. 79 to .86 by .60 to .65 in.; ovate to nearly oval; light blue to white (white eggs rather rare); figured by E. A. Capen in "Oölogy of New England," Plate I, Figs. 14, 15. *Dates:* March 31 to August 20, Virginia; April 15 to June 14, Connecticut; (April 8) April 15 to June 30, Massachusetts; April 21 to July 6, Maine. *Incubation:* Period 12 days (F. L Burns); by both parents. Two broods yearly; sometimes three.

Range. — Central and eastern North America (east of the Rockies) except northern part. Breeds in Lower Canadian, Transition and Austral zones from central Saskatchewan, southern Manitoba, northern Ontario, southeastern Quebec, northern New Brunswick and Nova Scotia south to central Texas, southern Louisiana, southern Alabama and southern Florida and (casually) west to central Montana, central Wyoming and central Colorado; winters from central-eastern Nebraska, central Missouri, southern Illinois, southern Michigan, northern Indiana, northern Ohio, southeastern New York and central-eastern Massachusetts south to the Gulf coast; resident in the Bermudas; accidental in Cuba.

Distribution in New England. — Common migrant and summer resident except at high elevations; rare winter resident in southern New England becoming not uncommon locally near southern coasts.

Season in Massachusetts. — Resident, but most common from March till November.

Haunts and Habits. Who does not welcome the beloved Bluebird and all that his coming implies? His cheery warble, heard at first as a mere wandering voice in the sky, heralds returning spring. There must be something wrong with the man who, hearing this brave and happy bird and seeing him fluttering and warbling in his lovely vernal dress, does not feel a responsive thrill. Snow may still lie in patches or drift in flurries; storm clouds may gather, and winter may retreat with slow and sullen steps, but when the Bluebird comes we know that spring is near.

The Bluebirds of New England have suffered two great catastrophes within my remembrance. The first was in the early 70's of the last century when the "English" Sparrows began to drive them from their nesting places. For years after that no Bluebirds were to be seen during the nesting season, in many regions where they were common previously. In 1895 cold and storms overwhelmed the Bluebirds in the south and almost wiped them out and for two or three years very few were seen in New England. Ten years later,

however, they had increased again to normal numbers. Now they are menaced by the spread of the European Starling and many an old orchard where hollow limbs formerly sheltered families of Bluebirds is now tenanted by the usurping foreigner. Some protection, however, may be given the Bluebirds by furnishing nesting boxes with a round entrance hole one and a half inches in diameter, which the Starling, being larger than the Bluebird, cannot enter.

In mild seasons a few Bluebirds appear in central Massachusetts by the 20th of February. Probably these are birds that have passed the winter in southern New England. Usually a considerable migration appears by the middle of March and continues well into April.

The earliest birds ordinarily are males and sometimes a flock of males is seen, but many birds are paired when they arrive. There are many combats among the rival males, and occasionally a pair of females will fight long and fiercely for the favor of a particular male. Now and then as the mating season advances an enthusiastic male will leave a tree-top and flutter up into the air for a hundred feet or so and then sail down again to his tree-top, singing all the way. The pretty flutterings and flitterings of the Bluebird in courtship are well known, and most of its habits are matters of common observation, since in New England it has become a tenant of the yard and orchard. Often the male is very gallant and sometimes is seen proffering food to his mate which she readily accepts.

The Bluebird likes to choose a nesting site near some open field or in a grass-grown orchard. In the search for suitable nesting places Bluebirds sometimes enter water conductors and being unable to fly out are drowned in cisterns. Occasionally one has entered a stovepipe in an unoccupied building and died in the stove.

Notwithstanding the Bluebird's gentle appearance and the apparent weakness of its weapons of defense it is a brave and often an aggressive bird. Mr. Adelbert Temple tells of a Bluebird that continually chased a Downy Woodpecker away from the limb on which it was working. Whenever the woodpecker found and exposed a grub the Bluebird chased him away and tried for the grub. Sometimes the Bluebird got the grub and sometimes the woodpecker was too quick. Mr. A. A. Saunders saw a pair of Bluebirds attacking Downy Woodpeckers and pulling feathers out of their backs; the Bluebirds used these feathers to line their nest. One day some dogs chased a neighbor's cat to the top of a bird house. The male Bluebird attacked that cat so savagely that it got down and faced the two dogs rather than the bird.

Like most of our farm birds the Bluebird is devoted to its young, which remain in the nest about 15 to 19 days. Both parents feed them and keep the nest clean. Usually when the first brood is out of the nest the male takes charge of it, while the female prepares a nest for the second brood.

There is always a feud between Bluebirds and House Wrens, especially when they wish to occupy the same nesting boxes or are domiciled near each other. However, Mr. Fred G. Knaub of New Haven, Connecticut, relates a strange experience with a Bluebird which attempted to feed some young House Wrens instead of attending to his

own young in a nesting box some thirty feet away from the wren box. This male Bluebird flew at the wrens and fought them desperately until they were so weak that they could hardly flutter up to the box with a worm to feed their young. Then he began to bring worms and insects and feed the little ones himself. This went on for two days and then Mr. Knaub surrounded the box with a wire netting with a mesh so small that the Bluebird could not enter the box, but it continued to harass the wrens.

Mr. Herbert M. Warren of Boston told me that when a female Bluebird that had a nest in a box near the back door was killed, the male took over the care of his young family and within a day or two found a new mate that was willing to help care for them. They grew apace, said Mr. Warren, "and finally left the box accompanied by their father and stepmother." Not all birds have the kindly disposition of this admirable stepmother.

The Bluebird is not always a model of constancy. There is at least one case on record where a pair separated and took other mates between the rearing of the first and second broods. Dr. Mary F. Hobart of Needham, Massachusetts, tells of a Bluebird that began a flirtation with a Canary on May 16th and continued it while his own mate was engaged in incubating her eggs. He frequently alighted on the Canary's cage and offered her worms or caterpillars until his own young ones of the second brood were hatched on July first, when he returned to his mate and took up his parental duties.

Young Bluebirds as well as the young of other birds that nest in hollow trees are sometimes killed by the larvæ of a blood sucking fly of the genus *Protocalliphora*. In some localities these larvæ, which bear a superficial resemblance to a tick, wipe out about 75 per cent of the young birds. In such cases the nests and all the dirt in the nesting box or cavity should be burned to prevent the larvæ which hide there from maturing.

Most of the late broods of Bluebirds are out of the nest in August and by the 10th of that month, small flocks, probably mostly young birds, may be seen moving southward. Birds that raise several broods, however, are sometimes much later, as very young fledglings are seen occasionally in September and large flights of Bluebirds go south in October. These late flights are not composed entirely of birds from the extreme northern part of the range, for in some of the cold nights of October families of Bluebirds have come back to their nesting boxes before leaving for the south. In at least one case the birds were banded, so that their identity was proven.

The few birds that remain through a New England winter, mostly along the southern coastal plain, or in the river valleys leading north from it, feed largely in thickets of Virginia juniper or red cedar where they are somewhat protected from the cold winds, and they roost in companies in hollow trees or nesting boxes, but there are some exceptions to this rule. In the autumn of 1921 Mr. William C. Wheeler of Waltham, Massachusetts, watched a Bluebird until dark on two evenings. On the first evening it snuggled down in an old Robin's nest and remained there. On the second, the same or another bird chose another Robin's nest near-by.

Mr. A. A. Cross of Huntington, Massachusetts, during a heavy snow-storm which is said to have destroyed many birds, watched a flock of Bluebirds that had found an abun-

dant supply of sumac berries on which they fed for several days. During the intervals between feeding they snuggled together side by side on a small dead branch sheltered by a building. Mr. Cross sent me a photograph of a long line of twenty-two birds, each one fluffed up like a little puff-ball. In western Massachusetts and in Vermont during late spring storms many bluebirds have died huddled together in hollow trees, where they sought refuge from the fury of the gale. During a storm a lady in Stowe, Vermont, heard a Bluebird calling in her living room and found two in the stove. They had sought shelter in the chimney and had come down the stovepipe.[1]

Occasionally we find a small colony of Bluebirds wintering together. Mr. George E. Hoxsie of Canonchet, Rhode Island, informed me in 1912 that there were, during the winter, from twenty to thirty of these birds that passed the night in his bird houses and went out over the country during the day to feed. Their chief food seemed to be seeds of the bayberry and sumac.[2]

The food of the Bluebird is of especial interest to the farmer and fruit grower as next to the Robin it is one of the most domestic of birds and nests freely about the farmstead and orchard. Almost seven-tenths of its food is derived from the animal kingdom, chiefly from insects, and the balance is vegetal, mainly wild fruit. The insect food consists of beetles, ants, flies, bugs, caterpillars and moths, grasshoppers, crickets and katydids, and it also eats spiders, myriapods, sow-bugs, snails and earthworms. Among the pests eaten are May beetles, wood-boring beetles, weevils including the white-pine weevil, cut-worms, army-worms, tent-caterpillars, gipsy-moth caterpillars, canker-worms, leaf-hoppers, plant-lice, cicadas and tree-hoppers. The vegetal food is confined chiefly to wild fruits such as those of the blackberry, bayberry, chokeberry, pokeweed, strawberry, bush-honeysuckle, Virginia juniper, black alder, wild grape, Virginia creeper, poison ivy, partridge vine, elder, smilax, holly, sumac, mountain ash, bittersweet, Japanese barberry, false spikenard, wild sarsaparilla, asparagus and rose. Now and then one may take a currant or a cherry. They also eat a few seeds of weeds and grass.

Economic Status. The Bluebird is useful as well as beautiful and, unlike the Robin, it has never been accused of serious depredations in the garden or orchard. It destroys quantities of pests and its only fault from our point of view is that it consumes rather a large proportion of useful predaceous beetles, but as hereinbefore stated, if these beetles are not held within the bounds of reasonable numbers, some of them are likely to become injurious by attacking crops, as has already happened in some instances.

[1] Commonwealth of Massachusetts, Department of Agriculture, Twelfth Annual Report of the State Ornithologist for the year 1919 (1920), pp. 8–10.

[2] Massachusetts State Board of Agriculture, Report of the State Ornithologist for the year 1912 (1913), pp. 12, 13.

New England Birds Exterminated or Extirpated in Recent Times

Since the white man first landed on the shores of New England several species of the native feathered inhabitants of the country have disappeared from this region. Three of these, the Great Auk, Labrador Duck and Passenger Pigeon, are now believed to be absolutely extinct, as is also, perhaps, the Eskimo Curlew. There may be two or three specimens of the Heath Hen still surviving on Marthas Vineyard while this is being written, but probably there will not be a single individual living in the entire world by the time this volume reaches the public.* Five other species, the Trumpeter Swan, Whooping Crane, Sandhill Crane, Long-billed Curlew and Wild Turkey, are practically extirpated today from New England though, as they are not actually extinct, there is still a possibility that a lone bird may wander into the territory or that one of the species may be introduced here. We have now the best of evidence that all but one of these birds were extirpated directly by man's agency and there is presumptive evidence to implicate man in the one doubtful case — that of the Labrador Duck.

Of the above list of ten species, all but the Great Auk, the Labrador Duck and the Wild Turkey have been treated in the first two volumes of this book.

Plaútus impénnis (Linnæus). **Great Auk.**

Other names: Penguin; Garefowl; Wobble.

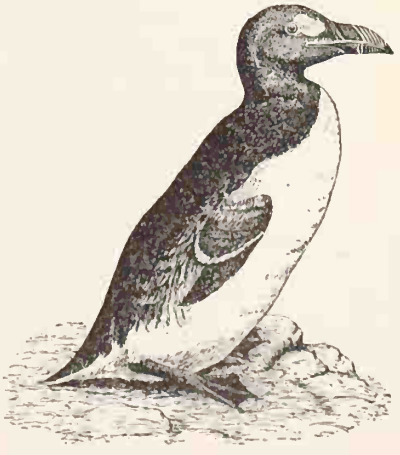
Description. — Very large bill, as long as head, compressed laterally and much grooved; neck rather short; wings rudimentary and not admitting of flight; feet large, the fore toes completely webbed; tail very short. *Adult in breeding plumage (sexes alike):* Above, black; sides of head and neck, chin and throat dark brown or blackish-brown; lower plumage, large oval patch before eye and bar formed by tips of secondaries, white; bill black, its grooves whitish; iris dark brown; legs and feet black.

Measurements. — Length 28.00 to 30.00 in.; folded wing about 5.75; tail about 3.00; bill about 3.15.

Breeding. — On northern coasts and islands. *Nest:* None, eggs laid on ground. *Eggs:* Resembling those of Razor-billed Auk (see Vol. I, page 43), but much larger; about 5.00 by 3.00 in.; pyriform-ovate; pale olive or buff marked with brown or black; figured by A. C. Bent in "Life Histories of North American Diving Birds," 1919, Plate I.

Range. — Formerly in Europe coastwise from Iceland south to the British Isles and in America coastwise from the southern part of the east coast of Greenland to Massachusetts; probably south in winter to Florida.

Season in Massachusetts. — Probably resident formerly, non-breeding birds remaining throughout the year.



Great Auk, Adult.

* A lone male Heath Hen was seen on September 4, 1929; as far as known this was the last living specimen and the species is now believed to be extinct. J. B. M.

History. — The Great Auk was a large bird, comparing in size with the geese, which in America wandered in its migrations from Labrador and possibly from Greenland, to Florida. It was known to the early explorers and settlers as the Penguin though not even closely related to that bird, the chief resemblance being that, like the Penguin, the Auk was a flightless swimming bird. At first sight it seems remarkable that this bird could perform such extended migrations by swimming, but fish migrate similar distances and the Greak Auk was a faster swimmer than the fish on which it fed.

A flightless bird has little chance against the weapons of civilized man, and so the bird disappeared from the seaward parts of the British Isles so long ago that few records remain of its presence there. The last specimen recorded at St. Kilda was killed in 1821; and the last at Eldey, off Iceland, in 1844. This ended the history of the bird in the Old World and so far as we know, the history of the Greak Auk.

In the meantime the same bird was found in America, where the end came even more quickly. Here, the relations of the white man with this bird began when adventurous French sailors commenced fishing on the banks of Newfoundland, soon after that island's discovery in 1497. As these birds bred on outlying reef-guarded islands, they had not been troubled much on their breeding grounds by the coast Indians, who at that time had a plentiful supply of other birds along the coast and did not need to take venturesome voyages in their frail bark canoes; but the white fishermen used these birds to provision their vessels and the young were taken for bait. These men, landing at Funk Island, the birds' principal breeding place off the coast of Newfoundland, killed them with clubs or surrounded them and drove them aboard their boats, where they were killed, taken aboard ship and salted down in barrels. Later, as the demand for feather-beds grew in the United States, the birds were slaughtered by thousands for their feathers alone. Stone enclosures or pounds were built into which the birds when surrounded were driven and there killed with clubs; they were then thrown into great kettles of hot water to scald them so that the feathers would come off easily. Many were salted down and merchants at Bonavista, Newfoundland, sold them to the poor in the place of pork.

Thus the uncounted hosts of the Great Auk went to their death, and the bird, according to Mr. Michael Carroll of Bonavista, disappeared from Funk Island, its greatest breeding place and its last refuge in America, between 1830 and 1840. There are about 80 specimens of the bird, about 70 eggs, and many bones and more or less complete skeletons, preserved in the museums of the world.

Little is known about the habits of the Great Auk. The Auk swam with head lifted, but neck drawn in, ready to dive instantly at the first alarm. On its island home it stood or rather sat erect, as its legs were far back. Its notes were gurgles and harsh croaks. It laid but one egg.

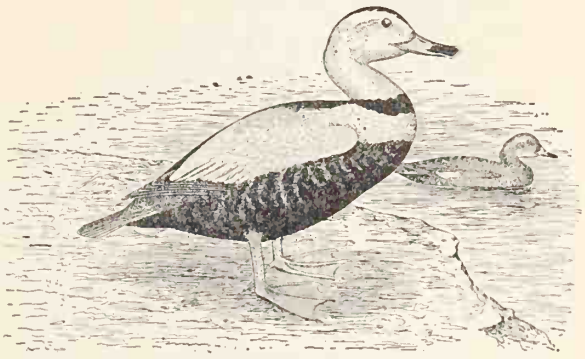
A fuller narration of the history of this interesting bird appears in one of my former works;[1] and an extended account of its history and biography may be found in "The Greak Auk or Garefowl" by Symington Grieve, published in London in 1885.

[1] Game Birds, Wild-Fowl and Shore Birds of Massachusetts and Adjacent States, Massachusetts State Board of Agriculture, 1912, pp. 399–410.

Camptorhýnchus labradórius (Gmelin). Labrador Duck.

Other names: Pied Duck; Sand Shoal Duck; Skunk Duck.

Description. — Bill nearly as long as head, about as wide as high at base and widened toward end; teeth of upper mandible slight, oblique, of lower mandible long; wing rather short, first and second primaries longest; tail quite short, two-fifths length of wing; feet large, front toes webbed to extreme tips. *Adult male:* Head, neck, scapulars and wings chiefly white; stiffened feathers of cheeks tinged brownish; longer scapulars pearl-gray; tertials black-edged; rest of plumage black or blackish, as also a wide stripe lengthwise along middle of crown and a broad ring round lower neck; wing linings and axillars white; "iris reddish-brown; bill black, orange at base and along edges, grayish-blue along ridge; feet grayish-blue with dusky webs and claws" (Coues). *Adult female:* Dappled brown with a white wing-patch or speculum and edges of tertials black; "bill, eyes, and feet as in male" (Coues). *Young male in first winter plumage:* Similar to adult female but with considerable white on throat, breast and wing-coverts; when changing into adult plumage young males were patched on head and wings with brown, black and white. *Young female in first winter plumage:* Similar to adult female.



Labrador Duck, Adult Male and Female.

Measurements. — Length about 18.00 to 23.75 in.; spread about 30.00; folded wing 8.50 to 9.00; tail about 3.50; bill 1.55 to 1.70; tarsus 1.50 to 1.60.

Breeding. — John W. Audubon was shown nests on top of tangled fir bushes on the north shore of the Gulf of St. Lawrence which he was told were those of the Pied Duck.[1] All information as to its breeding is based on hearsay, however.

Range. — Supposed to have bred on Labrador coast; ranged south in winter to Chesapeake Bay; may have gone farther north in breeding season but not recorded.

Distribution in New England. — Former fall and spring migrant and probable winter resident coastwise.

History. — The Labrador Duck or Pied Duck was first described by Gmelin. It is supposed to have bred in a limited area along the north coast of the Gulf of St. Lawrence but may have gone much farther north. About all that we really *know* about its extinction is that the last recorded living specimen died by the hand of man near Long Island, New York, in 1875, and that according to Mr. William Dutcher, who made a painstaking investigation of the matter, there were in 1894 but forty-two specimens recorded in the museums of the world, of which thirty were then in North America.[2]

Since Mr. Dutcher made this report, a few additional specimens have been discovered in collections, one of them being a young male, lacking all data as to place and time of taking, in the museum of the Boston Society of Natural History.[3]

Statements that its breeding range was limited to the southern coast of the Labrador

[1] Audubon, John J.: The Birds of America, Octavo Edition, Vol. VI, 1843, p. 329.

[2] Auk, Vol. XI, 1894, p. 176.

[3] Brooks, W. S.: Auk, Vol. XXIX, 1912, pp. 389, 390.

peninsula apparently are not substantiated by any direct evidence. We really know nothing about its nesting place or its nest and eggs. The opinion expressed by Professor Alfred Newton in his "Dictionary of Birds," that "the shooting down of nesting birds witnessed by Audubon when he was among the islands on the Labrador coast could have produced no other result" than the extermination of the birds, is based on the supposition that this was their breeding range.

To the depredations of the natives may be added those of the eggers as described by Audubon, and those of the American feather hunters. I have pointed out in "Game Birds, Wild-Fowl and Shore Birds," [1] that as early as the middle of the eighteenth century vessels were fitted out on the New England coast for the express purpose of visiting Labrador and capturing birds that bred there, for their feathers. These excursions were made evidently in the breeding season, when the adult wild-fowl had lost the power of flight through the molting of their wing-quills, and before the young were able to fly. Amos Otis, a historian of Barnstable County, Massachusetts, asserts that large numbers of wild-fowl congregated to breed on barren islands off the Labrador coast where the crews of these feather vessels surrounded them, drove them together and killed them with clubs. He says that "millions of wild-fowl" were thus destroyed and a few years later (after 1760) their haunts were so broken up by this wholesale slaughter and their numbers were so reduced that feather voyages became unprofitable and were given up. If the Labrador Duck had been definitely known to breed in that region and only there we might with confidence attribute its extinction largely to the depredations upon sea birds in the breeding season, which have continued almost to the present day. As it is, we can only conjecture that the Labrador Duck was exterminated by the hand of man.

Dr. D. G. Elliot said that between 1860 and 1870 he saw a considerable number of females and young males of the species in the New York market but that the full plumaged males were then exceedingly rare.[2] Although we have no later record of the bird in that market, no one realized then that it was rapidly approaching extinction or that the last recorded specimen would be taken in 1875.

[Note. The brief account of the history of the Labrador Duck ends abruptly — the last chapter of the "Birds of Massachusetts and other New England States" written by Edward Howe Forbush. One extirpated species remained to be treated, with the new species which were added to the avifauna of New England after the first volumes were completed. These only, with the Introduction, he left for another hand to finish. By so narrow a margin, the work upon which he had been engaged for nearly ten years, and upon which he lavished the results of his lifetime of study, missed its full fruition. J. B. M.]

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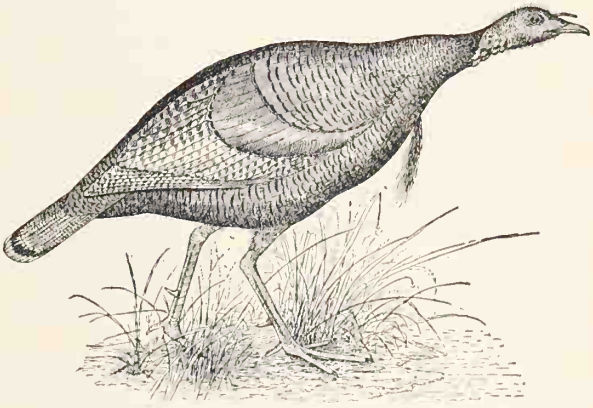
[1] Game Birds, Wild-Fowl and Shore Birds, 1912, pp. 411–416.

[2] Elliot, D. G.: Wild Fowl of the United States and British Possessions, 1898, pp. 172, 173.

Meleágris gallopávo silvéstris Vieillot. Wild Turkey.

Description. — Head and upper neck naked. *Adult male:* Head and upper neck red, variegated with blue, purplish and white, and covered with warty excrescences; body plumage generally brilliant metallic bronze, with gold, green and red reflections, each feather broad, square-ended, and tipped with a black band; rump black, with dark purple metallic gloss; upper tail-coverts chestnut with metallic red reflections; tail chestnut, black-barred, tipped with a deep buff band and a subterminal black band; wings black and bronze-green, quills white-barred; a bunch of coarse bristles suspended from center of breast; bill yellowish-white tinged with red; iris deep brown; legs and feet red, the scales outlined with yellowish-white, claws black. *Adult female:* Head and neck pinkish or pale reddish, smooth; plumage duller than male and with less metallic gloss. *Young in juvenal plumage (sexes alike):* Much like adult female but duller in color. *Downy young:* Above mottled with gray and different shades of brown; forehead and crown pale brown with dark brown median stripe on crown and shorter lateral stripes of same; below pale buffy or gray with a yellowish tinge, darker on breast and sides.



Wild Turkey, Adult Male.

Measurements. — Length of male about 48.00 in.; spread about 60.00; wing about 21.00; tail about 19.00; bill about 1.00; tarsus about 6.50; length of female about 36.00.

Field Marks. — Similar to domestic turkey but upper tail-coverts and tips of tail-feathers chestnut, with no white or pale buffy.

Voice. — Male, a loud gobbling, indistinguishable from domestic turkey, *gil-obble-obble-obble* (G. F. Simmons) or *ruk, oorook, oorook* (Nuttall); female, a plaintive piping; calls, *pit pit* or *quitt quitt*, when feeding, *cut-cut* when alarmed, and *keow, keow, kee, kee, keow, keow* when calling each other (C. Bendire).

Breeding. — In woodlands, usually near a swamp or stream. *Nest:* On ground, well concealed in a tangled thicket, among tall weeds, or under a fallen log; a slight depression, unlined or lined with dead leaves, grass or pine needles. *Eggs:* 7 to 18 (occasionally two or more hens nest together and as many as 48 eggs have been reported in one nest); 2.30 to 2.70 by 1.75 to 2.00 in.; ovate or elongate ovate; pale buff to pale creamy-white, more or less heavily marked with small spots (sometimes blotches) of reddish-brown, pale chocolate or pale lavender. *Incubation:* Period about 28 days; by female. One brood yearly unless disturbed.

Range. — Formerly southern Ontario and eastern United States except Florida, mainly in forested areas. Now extirpated in Canada and most of northern states and decreasing in south and west.

Former Distribution in New England. — *Maine:* No definite records but reported in southwestern part; a leg bone found in Indian shell heap on Mt. Desert Island.[1] *New Hampshire:* Probably resident north to region of Lake Winnepesaukee. *Vermont:* Probably limited largely to southern Connecticut Valley. *Massachusetts, Rhode Island and Connecticut:* Formerly abundant resident.

History in New England. — The following paragraphs are quotations from Mr. Forbush's earlier book, "A History of the Game Birds, Wild-Fowl and Shore Birds," published in 1912, where the Wild Turkey is treated at length on pages 487 to 494.

[1] Townsend, C. W.: Bulletin, Nuttall Ornithological Club, Vol. VI, 1881, p. 60.

"The discoverers and early explorers of North America found this bird ranging almost the entire length of the Atlantic coast line, from Florida to Nova Scotia, where it roved in great flocks, and often migrated in multitudes in search of food. It seems to have been particularly numerous in Massachusetts and New England. The first settlers found it a vital asset of the land and a substantial source of food supply.

"Champlain (1604) says that the Indians of the Massachusetts coast described a large bird that came to eat their corn. From their description he judged it to be a Turkey.[1] He landed on Cape Cod, and as the Cape was then well wooded, it doubtless was inhabited by this bird.

"Captain John Smith in 1622 reports 'great flocks of turkies' in New England.

"Thomas Morton (1632, Massachusetts) says: 'turkies there are, which divers times in great flocks have sallied by our doores; and then a gunne, being commonly in a redinesse, salutes them with such a courtesie, as makes them take a turne in the Cooke roome. They daunce by the doore so well.'[2] He asked his Indians what number they found in the woods, and they answered '*neent metawna*,' more than they could count, which Morton interprets as 'a thousand that day.'

"William Wood (1629–34, Massachusetts) writes: 'The Turky is a very large Bird, of a blacke colour, yet white in flesh; much bigger than our English Turky. He hath the use of his long legs so ready, that he can runne as fast as a Dogge, and flye as well as a Goose: of these sometimes there will be forty, three-score, and a hundred of a flocke, sometimes more and sometimes lesse; their feeding is Acornes, Hawes, and Berries, some of them get a haunt to frequent our English corne: In winter when the Snow covers the ground, they resort to the Sea shore to look for Shrimps, & such smal Fishes at low tides. Such as love Turkie hunting, must follow it in winter after a new falne Snow, when hee may follow them by their tracts; some have killed ten or a dozen in halfe a day; if they can be found towards an evening and watched where they peirch, if one come about ten or eleaven of the clocke he may shoote as often as he will, they will sit, unlesse they be slenderly wounded. These Turkies remaine all the yeare long, the price of a good Turkie cocke is foure shillings; and he is well worth it, for he may be in weight forty pound.'[3]

"Several Massachusetts town histories refer to the Turkey. Many hills and small streams of the Commonwealth have received their names from the Turkeys which once frequented them. We can form little idea to-day of the almost incredible abundance of these noble birds. . . .

"Shooting and trapping the birds at all times soon had its inevitable effect, and the Turkey retired rapidly before the advance of settlement, and soon it could be found only in the wildest parts of the country.

"Josselyn (1672, Massachusetts) says: 'I have also seen three-score broods of young *Turkies* on the side of a marsh, sunning of themselves in a morning betimes, but this was

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[1] Champlain, Samuel de: Voyages, Publication of the Prince Society, Vol. II, 1878, p. 88.
[2] Morton, Thomas: New English Canaan, Publication of the Prince Society, 1883, p. 192.
[3] Wood, William: New England's Prospect, Publication of the Prince Society, 1865.

thirty years since, the *English* and the *Indians* having now destroyed the breed, so that 'tis very rare to meet with a wild *Turkie* in the Woods.' [1]

"In Massachusetts Turkeys were most numerous in the oak and chestnut woods, for there they found most food. They were so plentiful in the hills bordering the Connecticut Valley that in 1711 they were sold in Hartford at one shilling four pence each, and in 1717 they were sold in Northampton, Mass., at the same price. From 1730 to 1735 the price of those dressed was in Northampton about one and one-half penny per pound. After 1766 the price was two and one-half pence, and in 1788, three pence. A few years after 1800 it was four pence to six pence a pound, and about 1820, when the birds had greatly decreased, the price per pound was from ten to twelve and one-half cents.

"In the last part of the eighteenth century most of the Wild Turkeys had been driven west of the Connecticut River, but there were still a good many in the Berkshire Hills and along the Connecticut Valley on both sides of the river.

"Belknap (1792) says 'they are now retired to the inland mountainous country.'[2] In Connecticut in 1813 the last recorded bird was seen, and a few were still left in Vermont in 1842.[3]

"De Kay (1844) wrote that the Turkey had disappeared almost entirely from the Atlantic States, but that a few were still to be found about Mt. Holyoke in Massachusetts, and in Sussex County, New Jersey, as well as in some of the mountainous parts of New York.[4]

"Brewster states in his Birds of the Cambridge Region, that the Wild Turkey was not exterminated in Concord, Mass., only twenty miles from Boston, until after the beginning of the nineteenth century.

"Emmons (1833) gives the Wild Turkey in his list as a rare resident in Massachusetts, 'now become scarce and nearly extinct'; but in a footnote Dr. Hitchcock states that the bird is frequently met with on Mt. Holyoke.[5]

"Thompson (1842) states that the Turkey had then become exceedingly rare in all parts of New England, but that it still bred on the mountains in the southern part of Vermont.[6]

"Wild Turkeys are believed to have existed on Mt. Tom and Mt. Holyoke longer than anywhere else in Massachusetts. There was a flock on Mt. Tom in 1842, a few in 1845, and a single Turkey in 1851. Some remained on Mt. Holyoke nearly as long.[7]

"It generally is believed that the last specimen actually known to have been captured in Massachusetts was shot on Mt. Tom in the winter of 1850–51.[8]

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[1] Josselyn, John: New-England's Rarities, 1865, p. 42.

[2] Belknap, Jeremy: History of New-Hampshire, Vol. III, 1792, p. 170.

[3] Chamberlain, Montague: Handbook of Ornithology, United States and Canada, based on Nuttall's Manual, Vol. II, 1891, p. 21.

[4] De Kay, James E.: New York Fauna, Part II, 1844, p. 200.

[5] Hitchcock, Edward: Report of the Geology, Mineralogy, Botany and Zoölogy of Massachusetts, 1835, p. 531.

[6] Thompson, Zadock: History of Vermont, 1842, p. 101.

[7] Judd, Sylvester: History of Hadley, 1863, p. 358.

[8] Howe, Reginald Heber, and Allen, Glover Morrill: Birds of Massachusetts, 1901, p. 133.

"In the History of the Sesqui-Centennial Celebration of South Hadley, the statement is made that a few Turkeys were left on Mt. Holyoke later than 1851. It is said that a year or two before the outbreak of the Civil War a party of hunters from Springfield and Holyoke went to Rock Ferry, and there divided, a part ascending the north peak of Mt. Tom and the others crossing the river to Mt. Holyoke, north and east of the well-known roosting place of the birds. The latter party beat the woods and drove the few surviving Turkeys to the southerly end of the mountain, whence they took flight for Mt. Tom, but before the poor creatures could alight, the guns of the ambushed hunters had exterminated them.

"Wild Turkeys were reported as seen on Mt. Holyoke as late as 1863, when one was said to have been killed by a hunting party. A statement is made by Dr. T. M. Brewer that some were shot at Montague and other towns of Franklin County within a few years prior to 1874,[1] but Mr. Robert O. Morris of Springfield, who has investigated the evidence, believes that these later Turkeys had escaped from domestication, and that the last of the native wild birds was that recorded as killed in 1851.

"Since then the Wild Turkey has disappeared from Canada and from the Atlantic seaboard, although a few are still to be found in Virginia and other southern States, and it is still common in some western localities.

"The habits of this Turkey have been well described by Audubon, and no extended notice of them is necessary. Although it is a bird of the woods, where it roosts high in the tall timber, in the deep fastnesses of which it hides, it likes to come out in the open and search in the tall grass of field, meadow or prairie for insects of which it is fond. When discovered in such a situation it usually tries to steal away through the long grass; if followed it runs rapidly, and if closely pressed rises and flies, often a long distance, generally making for timber if possible, where it disappears like magic in the thickets. I well remember when I started my first old gobbler from the long prairie grass. The rising sun at my back was just throwing its level beams across the grassy sea as I emerged from the timber, between the bird and its retreat. At the sound of my gun the great bird rose resplendent from the grass, gorgeous with metallic reflections, its broad wings throwing off the sun rays like polished bronze and gold, — a sight, as it sailed away, to be long remembered. . . .

"In the mating season the males strut, gobble and fight in the manner of the domestic Turkey. The female steals away by herself to make her nest, and guards her secret carefully from her many enemies, of which the male is not the least, for he will destroy the eggs or the young birds if he finds them. The young are very weak when first hatched and will hardly survive a good wetting; Audubon says that when the young have become chilled and ill the female feeds them the buds of the spicebush (*Benzoin benzoin*); but, however she manages, she often succeeds in rearing the brood. The fox and lynx are among her most dangerous enemies at this time, but later, when the young birds have

[1] Baird, Brewer and Ridgway: A History of North American Birds, Land Birds, Vol. III, 1905, p. 405.

learned to fly and to roost in the trees, the Great Horned Owl takes its toll from their numbers.

"The Wild Turkey adapts itself to circumstances in regard to food, eating acorns, berries, buds, weed seeds, grass seeds and other vegetable food. It is also fond of grain, and this no doubt led to its extirpation in Massachusetts. The gunners watched in the cornfields, or laid long lines of corn in ditches, where they could rake a whole flock, or baited the birds into pens, in which whole broods were captured. But the birds, both young and old, often are useful to the farmer, for they are fond of insects, particularly grasshoppers. Dr. Judd makes an excellent contribution to the literature on the food habits of the Wild Turkey, including an examination of sixteen stomachs and crops of Turkeys, made by the Biological Survey. These contained 15.57 per cent of animal matter and 84.43 per cent of vegetable matter. The animal food comprises insects, 15.15 per cent; miscellaneous invertebrates (spiders, snails and myriapods), .42 per cent. Of the animal food, 13.92 per cent consisted of grasshoppers. Beetles, flies, caterpillars and other insects made up the residue of 1.23 per cent. The list of animal and vegetable food as given by Dr. Judd is favorable to the Turkey, as it contains insect pests, wild berries and no vegetable food of value to mankind.[1]

"The varied food of this bird gives it the finest flavor of any fowl that I have ever tasted, and its great size and beauty contribute to make it, to my mind, the noblest game bird in the world. It is destined to vanish forever from the earth unless our people begin at once to protect it."

[1] Judd, Sylvester D.: The Grouse and Wild Turkeys of the United States and their Economic Value, United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 24, 1905, pp. 49, 50.

Recent Additions to the Avifauna of New England.

Contributed by John B. May.

The explorers and settlers of New England were impressed with the great number and variety of the birds of the region. Some of the earliest references to our birds are found in Archer's and Brereton's accounts of Gosnold's voyages in 1602 to what is now the coast of Massachusetts. Martin Pring in 1603 described the "great store" of river and sea fowl found there and Champlain in 1606 made a map of his landing place at Chatham on Cape Cod and marked upon it "a fresh water pond with quantities of wild fowl" (see Vol. II, page xxv).

The principal interest in birds on the part of these early explorers and the succeeding settlers was gastronomic. In time the interest broadened and today there are thousands of bird lovers in New England, studying the habits of our feathered neighbors, prying into their most intimate affairs, examining their minutest anatomy, until it would seem that there is nothing left to learn about our avian visitors. With the increased interest the lists of the species found in New England have grown and in 1909 Dr. Glover M. Allen listed about 400 species as occurring in that region.[1]

So it would seem, on first thought, that we must know about all that there is to learn regarding our birds and certainly that, after more than three hundred years, we cannot expect to add many new names to the list of species. And yet in the last eight years, since Mr. Forbush began this book, six new species have been recorded from specimens taken in New England and now in the collections of our museums. On pages 217 and 218 of the first volume of the "Birds of Massachusetts" Mr. Forbush described the Sheld Duck, *Tadorna tadorna*, an Old World species recorded for the first time in North America off the coast of Essex County, Massachusetts, October 5, 1921. On page 292 of the same volume he recorded briefly a Pink-footed Goose, *Anser brachyrhynchus*, taken for the first time on the American continent, September 25, 1924, also in Essex County. Four more species have been added to the avifauna of New England since the second volume was published, and accounts of these birds follow.

With the increased protection given our birds by law and by public opinion, with the decrease in the number of scientific "collectors" and with the large number of skilled and careful field observers in New England today, it is most natural that "sight records" of new species should increase but that the records of new species "taken" should be few and far between. Numerous species have been reported by observers whom we have every reason to believe were correct in their identifications except for the fact that no earlier specimens had been taken in the same state of the Union, though they may have been "taken" at points more remote from their usual habitat. The Black-throated Gray Warbler was carefully identified in Massachusetts in 1918, five years before a specimen was taken. The Golden-cheeked Warbler, Townsend's Warbler and Kirtland's Warbler

[1] Occasional Papers of the Boston Society of Natural History, VII, Fauna of New England, No. 11, List of the Aves, 1909.

are others which have been reported as seen under the best of conditions but which must remain on the "hypothetical list" because no specimen of any of these species has been collected in New England. Similarly trustworthy reports have been received of the Red-shank, White-tailed Kite, Greenland Wheatear and other birds which are unmistakable when seen under favorable conditions by careful observers. The Wheatear, which breeds in Labrador but winters in the Old World, has been taken several times *south* of New England and in all probability crossed our terrain to reach the points where the specimens were taken.

It is interesting to note that, of the four species described below as new to New England, two of the records are based upon specimens which were deliberately collected in the name of science, after having been identified in the field, while the other two records may be described as purely accidental. One of the latter was that of a bird which was illegally killed by a poacher and by only the barest chance missed its intended fate in the stewpot; the other was taken by a French-Canadian fisherman-guide, preserved because it looked "queer" and identified months later by a casual sportsman visitor. By only the narrowest margins did these two species find places on the "accepted" instead of the "hypothetical" lists. Similar chance entered into the two records of the western races of *Junco hyemalis* which are recorded earlier in this volume (see pages 90 to 92); one, collected at random by a famous ornithologist, by his keen eye was identified later; the other, recognized while visiting the feeding station of another ornithologist, was collected that the record might become authentic.

Vanéllus vanéllus (Linnæus). Lapwing.

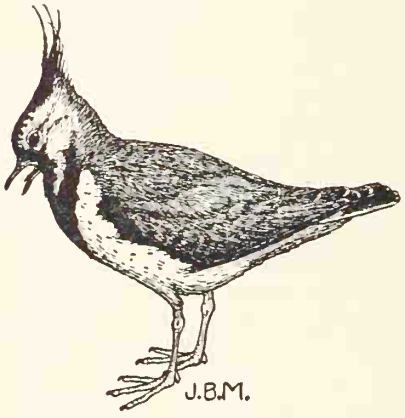
Other names: EUROPEAN LAPWING PLOVER; GREEN PLOVER; HORN-PIE; PEEWIT; PEASEWEEP; DIXHUIT.

Description. — A large plover-like bird with a slender recurved crest. *Adult male in breeding plumage:* Forehead, crown including crest, anterior portion of lores and malar region, chin, throat and chest uniform blue-black, faintly glossy; sides of head and neck white, becoming gray on hind neck; back, scapulars and tertials iridescent bronze-green, becoming coppery-purple on outer scapulars; wing-coverts dark purplish-blue becoming decidedly green on greater coverts; flight-feathers dull black, tips of three outer primaries light gray with white shafts; rump like back but less metallic; upper tail-coverts cinnamon-rufous; tail dull black with basal half and tip white, the white increasing in amount on outer feathers; under tail-coverts light cinnamon-rufous; rest of under parts except throat and chest white; bill black; iris dark brown; legs and feet flesh-red or lake-red. *Adult female in breeding plumage:* Similar but duller and crest shorter. *Adults in winter:* Similar to breeding adults but anterior portion of lores and malar region, a broad superciliary stripe, chin and entire throat white; white on sides of hind neck and occiput tinged buffy. *Immature:* Similar to adult in winter but crest absent or slightly developed; hind neck, back, rump, etc., brownish-olive or slightly metallic-olive, the feathers tipped or margined light rusty or tawny-olive, as are wing-coverts; black of chest duller. *Downy young:* Upper parts grayish-brown or drab coarsely mottled or marbled black; a broad band of unspotted brownish-buff or buffy-white across hind neck; chin and throat unspotted dull white or buffy-white, extending to lores and malar region; suborbital and auricular regions pale buffy-brown with irregular streaks and blotches of

black on lower edge; blackish band across lower fore neck or upper chest; rest of under parts unspotted white, strongly tinged brownish-buff posteriorly.

Measurements. — Length about 13.00 in.; folded wing 8.50 to 9.00; tail 3.75 to 4.75; bill .95 to 1.05; tarsus 1.70 to 2.00.

Molts. — First winter plumage acquired by partial postjuvenal molt (July to December) which includes most of body feathers but not flight-feathers or tail-feathers; first summer plumage acquired by partial prenuptial molt involving head, nape, throat, breast, some scapulars and coverts and sometimes innermost secondaries but not rest of body plumage or flight or tail-feathers; adult has complete postnuptial molt (August to November) and partial prenuptial molt (February to May).



Lapwing, Adult.

Field Marks. — Large size and plover-like form; at a distance appears black and white in about equal amounts; black crown and breast, bronzy-green and coppery-purple upper parts, white cheeks, breast and abdomen, and rufous or bay upper and lower tail-coverts; *long, recurved, pointed crest;* slow *flopping* heron-like flight; and distinctive calls.

Voice. — An oft-repeated "wailing," "melancholy" or "peevish" note; *pee-weet,* or *weet-a-weet, pee-weet-weet* (H. Seebohm); *whey-willuchooee-willuch-willuch-cooee* (S. E. Brock); "the Norfolk marshmen's transliteration is also good, 'Three bullocks a week, week after week'" (F. C. R. Jourdaine).

Breeding. — In moorlands or bushy meadows, or in open or plowed land. *Nest:* In a small depression, of dry grasses, straws or rushes. *Eggs:* 3 to 5, usually 4; 1.75 to 2.00 by 1.28 to 1.40 in.; pyriform; very variable, pale green, olive-green, olive-brown, brownish or yellowish, spotted and blotched with black or blackish-brown and inky-gray; figured by Henry Seebohm in "A History of British Birds," 1885, Plate 27. *Dates:* Late March and early April, England. *Incubation:* 24 to 25 days, sometimes 27 or 28; by both sexes. One brood yearly unless disturbed.

Range. — Northern part of Eastern Hemisphere. Breeds in Europe from the Arctic Circle to Spain and Macedonia and in northern Asia east to the Pacific Ocean and south to China (said to breed in Morocco and Egypt); winters from the British Isles to southern Europe, central Africa and Atlantic islands (Canaries, Madeira, etc.), Asia Minor, Persia, northern India, China, Burma and southern Japan; casual or accidental in Iceland, Greenland, Baffin Island, Canadian and Newfoundland Labrador, Newfoundland, Nova Scotia, New Brunswick, Ontario, Maine, New York, North Carolina, Bahamas, Barbados and western Alaska.

Distribution in New England. — Accidental visitor. One record: *Maine:* Square Lake, Aroostook County, December 21 or 22, 1927, bird shot by Ernest Boucher, now in collection of Boston Society of Natural History.[1]

Haunts and Habits. The Lapwing is an abundant bird in many parts of Europe and is readily recognized by its distinctive markings, its peculiar flight and its characteristic wailing cries. It is a noisy bird about its breeding place and frequently betrays its nest by its excited actions and its loud and repeated calls. Its direct flight is characterized by the steady and rather slow "flopping" of its broad rounded wings, each stroke impelling the bird forward with a manifest though easy jerk. During courtship and

[1] Peters, James L.: Bulletin, Boston Society of Natural History, No. 51, 1929, pp. 10, 11.

about the nest the male performs remarkable aërial evolutions, twisting, turning and diving through the air.

Until early winter, 1927, the Lapwing was known merely as an accidental straggler to North America, single birds having been taken at various points and at considerable intervals, from Newfoundland to Barbados. In October, 1927, another Lapwing straggler was taken on Baffin Island. But in December Lapwings were suddenly reported from Newfoundland by hundreds and some estimates counted them by thousands! Within the next few weeks birds were also observed in Labrador, Nova Scotia, New Brunswick and Maine. Mr. H. F. Witherby, editor of "British Birds," describes the flight in detail in that journal and I cite his data freely below.[1]

During the third week of December, 1927, Great Britain was visited by a "spell" of unusually cold weather, accompanied by high winds. On December 16 the British Air Ministry reported easterly winds of about 50 miles per hour across most of the north Atlantic, and on December 19 and 20 easterly winds of about 55 miles velocity extending almost to Newfoundland. The frozen ground forced the Lapwings to migrate in search of food and three observers in England reported seeing flocks leaving the west coast on December 18, headed west or south-west. Between December 19 and the middle of January nine Lapwings banded in northern England or southern Scotland were taken in Ireland, and on December 27 one was taken near Bonavista, Newfoundland, which had been "ringed" in Cumberland, England, in May, 1926. There are indications that a small flight of Lapwings accompanied the earlier "blow" for a specimen was taken at St. Augustine, Saguenay County, Quebec, "about December 15, 1927" by Mr. Thomas Kennedy, according to Mr. P. A. Taverner;[2] one or more were seen at Garnish, Newfoundland, "December 16th and 17th," and one was reported killed at Ramea Island, Newfoundland, December 19.

The principal flight of Lapwings appeared in Newfoundland December 20 and on subsequent dates, and according to Mr. Witherby must have left England the evening of December 19. The Lapwing's known migration speed of about 45 miles per hour, added to the wind velocity of 55 miles, would give an actual speed of about 100 miles per hour and the trip from the west coast of Scotland and northern England to Newfoundland, approximately 2,200 miles, could be covered in 24 hours without resting. Near Bonavista, Newfoundland, the first Lapwings were reported on December 20. "They were in small lots of from two or three to fifteen or twenty, but the bulk were not seen until the morning of the 21st, when the local policeman estimated that he saw 500 in a morning's walk, and the keeper of the fog alarm, three miles away, stated that he saw more than 1,000" (Witherby). Many were killed and eaten though in poor, thin condition, and a few specimens were preserved and added to museum collections. The birds were reported from many points in Newfoundland; from Hopedale, Labrador, December 24 and Bradore, December 26; Cape Breton Island, December 26; Richmond

[1] British Birds, Vol. XXI, 1928, pp. 215, 216; Vol. XXII, 1928, pp. 6–13, 43, 68, 69.
[2] Auk, Vol. XLVI, 1929, p. 231.

and Antigonish counties, Nova Scotia, December 30; and from St. John and Grand Manan, New Brunswick, the first week in January, 1928.

Mr. Francis N. Balch of Boston furnished me the following data regarding the one New England representative of this remarkable incursion. The bird was shot by Ernest Boucher, of Sinclair, Maine, a guide, who while fishing through the ice in Square Lake, near Sinclair, "saw a strange bird on the ice. He tried to approach it and found it could not fly but could flutter along so that he could not catch it. He went ashore and got a gun and shot it. He is almost certain it was three days before Christmas [1927] but thinks it might possibly have been four. He said it had no toes. The toes no doubt were frozen off while the bird was on the ice unable to fly." [1]

What was in all probability the last living survivor of this unique flight of Lapwings is described by Mr. Oliver L. Austin, Jr., as follows:

"I reached Battle Harbor early in June. The natives told me several Lapwings had been seen there, and though a few had been killed, no specimens had been saved. Nobody knew the exact date of their arrival, except that it was during a spell of exceedingly mild weather during the week before Christmas. The same story was echoed all along the coast, and I saw no proof of the occurrence of the birds until I reached Gready. Robert Stevenson, the wireless operator there, had saved for me a live female Lapwing which was one of a pair that had been wing-tipped by a hungry native when the birds arrived in December and kept alive in his hut all winter. The male perished from cold and neglect, but the female managed to pull through — probably because it was not as badly wounded as its mate. Stevenson bought it from the native at Easter time, and kept it alive on a diet of oatmeal, mussels and chopped seal and whale meat. We took the bird aboard the 'Ariel' August 23 and tried to bring it home alive in a crude cage on deck. It seemed healthy, spirited and contented in its new surroundings, eating all the mussels we could open and all the whale meat we could chop up for it. But, for no apparent reason, it died suddenly two weeks later during a rainy, stormy night off the west coast of Newfoundland. I saved the rather bedraggled skin, and performed an autopsy which showed nothing but the atrophied wing-tip, extreme emaciation and a trace of biliousness.

"Stevenson told me the Lapwings were numerous in Sandwich Bay and Hamilton Inlet, between Gready and Northwest River. They occurred in flocks numbering from ten to fifty individuals apiece. He could give no accurate dates. . . ." [2]

Some interesting sidelights on this Lapwing migration are found in Mr. Witherby's statement that Mr. F. A. Bruton caught a Song Thrush, *Turdus philomelus*, about 500 miles west of Ireland, December 20, 1927, while on a ship from Newfoundland to England (Witherby, *vide supra*); in Mr. Austin's records of a European Coot, *Fulica atra atra*, taken at Separation Point, Labrador, "during the week preceding Christmas, 1927," a European Common Snipe, *Capella gallinago gallinago*, and a European Jack Snipe, *Limnocryptes minimus*, both taken at Makkovik, Labrador, December 24, 1927 (Austin,

[1] Balch, Francis N.: *in litt.*

[2] Auk, Vol. XLVI, 1929, pp. 207–210.

vide supra); and in Mr. P. A. Taverner's record of another European Coot taken at Exploits Harbor, Newfoundland, "some time in the previous December," according to a letter from Mr. Gower Rabbitts dated May 7, 1928.[1]

The food of the Lapwing is said to consist largely of animal matter and to be composed of grubs, wire-worms and other insects, earth-worms and mollusks, with a few seeds and some tender herbage and sometimes bits of seaweed. The crops of some of the Newfoundland specimens contained "beetles, marsh-berries, grass roots, and worms" (H. F. Witherby).

Economic Status. The insect food of the Lapwing renders it of great economic value to the agriculturist wherever it is abundant. Dr. Walter E. Collinge calls it "the farmer's best friend" and quotes Mr. F. A. Theobald as writing "there is no bird more beneficial to the cultivator than the Lapwing." [2]

Its eggs have a high commercial value and have been an article of food in Europe and Asia from time immemorial. Dr. T. G. Pearson, writing of conditions in Holland, states that "from the Isle of Texel there are annually exported about 30,000 eggs. In the markets in Sneek and Leeuwarden, every week from 5,000 to 15,000 Lapwings' eggs are sold. Several hundred thousands are collected for market in Holland annually." [3]

This annual egg-collecting business would long ago have depleted the ranks of the Lapwing were it not for the intelligent coöperation of the Dutch people in observing the wise protective laws of Holland. The killing of Lapwings is strictly prohibited, but eggs can be taken until April 28 each year, after which date heavy fines may be incurred. As the birds are persistent layers when robbed, they lay more eggs and are allowed to raise their broods unmolested after April 28.

"In some other countries of Europe the taking of Lapwings' eggs is prohibited but the birds themselves may be killed, and in these countries it is reported that they seem to be decreasing while in Holland the birds are extremely abundant in all favorable localities" (Pearson, *vide supra*).

Asyndésmus léwisi Riley. Lewis's Woodpecker.

Other names: BLACK WOODPECKER; CROW WOODPECKER.

Description. — *Adult male:* Upper parts generally, with posterior flanks and under tail-coverts, plain glossy greenish-black; forehead, lores, cheeks, chin and upper throat dark crimson or bright burnt-carmine; lower throat dull black, the feathers tipped more or less with grayish-white; chest and broad clearly-defined collar light silvery-gray; breast, abdomen, sides and rest of flanks pinkish-red or light crimson, intimately mixed with fine longitudinal streaking of pale silvery-gray or white, the feathers having a peculiar "wiry" or bristly effect; wings and tail uniform black below, faintly glossed with greenish; bill dull black or dusky; iris brown; tarsi and feet gray or bluish-gray. *Adult female:* Similar to adult male, sometimes indistinguishable, but usually with gray of chest intermixed with dusky. *Young*

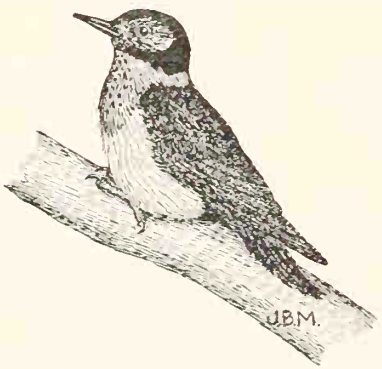
[1] Auk, Vol. XLVI, 1929, p. 227.
[2] Collinge, Walter E.: The Food of Some British Wild Birds, 1924–1927, pp. 231, 233.
[3] Bird-Lore, Vol. XXX, 1928, p. 299.

in juvenal plumage: Crimson of face mostly replaced by black or dusky; gray collar obsolete or entirely wanting; under parts dull grayish-white and dusky, or pale gray, suffused with pink in places; inner secondaries sometimes tipped with whitish.

Measurements. — Length 10.50 to 11.50 in.; spread 20.00 to 22.00; wing 6.50 to 7.00; tail 4.40 to 4.70; bill 1.00 to 1.30; tarsus .95 to 1.05. Female slightly smaller than male.

Molts. — Adult plumage is assumed after the postjuvenal molt.

Field Marks. — Near size of Robin; between Flicker and Hairy Woodpecker. A black-appearing bird with greenish gloss in good light; gray chest and pinkish breast and abdomen; adults with crimson face and gray collar. No clear white areas. Characteristic direct, crow-like flight and flycatching habits.



Lewis's Woodpecker.

Voice. — A rather silent bird. "In the mating season it utters a harsh *chirr* and a high-pitched squealing *chee-up,* repeated at rather long intervals. Adult birds utter near the nest a series of sharp metallic cries like the syllable *ick, ick, ick,* which when rapidly repeated become a rattle" (R. Hoffmann).

Breeding. — In rather open areas in forested regions. *Nest:* A hole excavated by the birds, but sometimes occupied for several seasons; in a dead branch or bare stub, 6 to 100 feet from ground; about 25 to 30 inches deep with entrance 2 to 2½ inches in diameter. *Eggs:* 5 to 9; .94 to 1.18 by .65 to .88 in.; ovate or short ovate; dull opaque white without gloss. *Incubation:* About two weeks; by both sexes.

Range. — Southwestern Canada, western United States and northern Mexico. Breeds from southern British Columbia to southern Alberta, southern Saskatchewan and western South Dakota south to California, Arizona and New Mexico; winters from British Columbia (occasionally), Utah, Colorado and northwestern Nebraska south to Lower California, Arizona, Chihuahua and southwestern Texas; casual east to eastern Kansas and eastern Oklahoma; accidental in Iowa, Illinois and Rhode Island.

Distribution in New England. — Accidental visitor. One record: *Rhode Island:* Providence, November 16, 1928, a bird shot by a boy and confiscated by J. J. Triggs, now in mounted collection of Park Museum of Providence; a second bird seen by Mr. Triggs.[1]

Haunts and Habits. The Lewis's Woodpecker is an easily recognized species, as it is a creature of decided individuality and of striking and unique markings. William L. Finley says that this bird "is one of the most interesting of all western birds. He has developed a character that makes him very much unlike a typical woodpecker. In the first place, his iridescent greenish-black coat and his method of flying are more like those of a Crow than any of our other Woodpeckers. In the second place, he has departed somewhat from the ancestral habit of hard work by digging grubs out of old stumps, for he much prefers to cruise around in the air snapping up insects like a Flycatcher, and to vary his meals with fruit and berries like a Robin. At certain times and places, he has been known to store up acorns somewhat after the manner of his cousin, the California Woodpecker." [2]

Ralph Hoffmann writes: "On first seeing a Lewis Woodpecker, one thinks rather of a small crow than a woodpecker; the *broad black wings* are almost continually flapped

[1] Walter, Mrs. A. H.: *in litt.*

[2] Finley, William L.: National Association of Audubon Societies, Educational Leaflet No. 112.

and the bird's flight is steady and easy. . . . It often lights on the top of a bare limb or even, when acorn-hunting, among the upper foliage of a live oak. The Lewis Woodpecker is a skilful flycatcher, sallying out in any direction on set wings, turning and sailing back to its stub without a single stroke. After alighting it frequently bobs its head. . . . The general appearance of the Lewis Woodpecker at a distance is black, but a near view shows a *gray collar* across the back of the neck and the *coarse red feathers* of the under parts. It is a great wanderer, appearing almost anywhere in the lowlands after the breeding season, especially where acorns are abundant. When it breeds in forested regions, it prefers rather open country, clearings and burns; it is common in open valleys in hilly country, using the fence posts and telephone poles as perches." [1]

The only specimen of this species recorded from New England was reported to me in a letter from Mrs. Alice Hall Walter, dated at Providence, Rhode Island, November 25, 1928, as follows: — "November 16, one of a pair of Lewis's Woodpeckers was shot by an Italian boy on the west side of Providence on the Obadiah Brown farm, now a public recreation ground. Superintendent Triggs of the Park happened to be near there, secured the bird and took it to Mr. William Bryant, Curator of the Park Museum, for identification."

Mr. Bryant tells me that Mr. Triggs was inspecting the newly acquired park property and that "hearing a shot in the vicinity of a small swamp he ran over and on investigating found that two boys, who ran away at his approach, had just shot a strange bird which they dropped as they ran. The bird was dead when picked up. The shooting occurred on a side hill covered with scrub oak on the margins of an alder swamp and Mr. Triggs observed a bird of the same species flying about not over two hundred yards from where the first bird was killed." [2]

In connection with this Rhode Island specimen it is interesting to find that "The Bulletin, Iowa Ornithologists Union" for February, 1929, also reports a Lewis's Woodpecker at Sioux City, Iowa, first seen in November, 1928, about the time the New England bird was taken, comprising, I believe, the first record for that state.[3]

Lewis's Woodpecker is largely insectivorous throughout the year but at certain seasons eats acorns, berries and small fruits.

Economic Status. While the Lewis's Woodpecker eats some predacious beetles, most of its animal food consists of insects which are classed as either injurious or non-beneficial. About 25 per cent of its total food throughout the year is composed of fruits, wild or cultivated. It is accused of occasionally causing considerable damage in apple orchards but as Mr. P. A. Taverner states "the species is never anything more than a local problem."

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[1] Hoffmann, Ralph: Birds of the Pacific States, 1927, p. 194.

[2] Bryant, William L.: *in litt.*

[3] Bird-Lore, Vol. XXXI, 1929, p. 136.

Zonotrichia quérula (Nuttall). Harris's Sparrow.

Other names: HOODED SPARROW; MOURNING SPARROW; BLACK-CROWNED SPARROW; BLACK-HEADED SPARROW.

Description. — A large sparrow with black face and breast or black blotch on breast. *Adults in breeding plumage (sexes alike)*: Crown, lores and region about eyes, chin, throat and center of upper breast black; above reddish-brown streaked dark brown; rump brownish-ashy; tail fuscous-gray; two whitish wing-bars; sides of head and neck ash-gray; lower breast and abdomen pure white, former more or less spotted black; sides and flanks light brownish, streaked darker; bill yellow or yellowish-red, tip dusky; iris dark brown; feet pale reddish-brown. *Adults in winter plumage:* Back and flanks somewhat browner; cheeks buff instead of gray. *Young in first winter plumage:* Throat largely white (sometimes with more or less black on throat), a broad "necklace" of black spots or blotches on upper breast; black of crown largely obscured by brownish or grayish feather-edges giving a "scaled" appearance. *Young in juvenal plumage:* Much like juvenal Song Sparrow.

Harris's Sparrow, Adult and Juvenile.

Measurements. — Length 6.75 to 7.75 in.; spread 10.40 to 11.00 or more; wing 3.20 to 3.50; tail 3.30 to 3.75; bill .45 to .52; tarsus .95 to 1.00. Female slightly smaller than male.

Molts. — "At the postjuvenal molt the body feathers and wing-coverts are renewed, the tail and wing-quills being retained, and the first winter plumage is acquired by the first week in September. . . . The spring (prenuptial) molt begins in March. It appears to be largely restricted to the head, neck and anterior parts of the body and to be of less extent in the adult than in the immature birds. After the breeding plumage is acquired there is but little change in the color of the bird's plumage" (F. M. Chapman).[1] The Massachusetts specimen was molting, most of the feather tracts of the head and body being involved, also the tertials and middle tail-feathers.

Field Marks. — About size of Fox Sparrow. A large sparrow with black crown, face and throat (adult) or black blotch on white breast (immature), and with gray or buff cheeks.

Voice. — Call a sharp metallic *clink* (F. M. Chapman); "a queer chuckling note" (W. W. Cooke); a plaintive whistle (Mrs. F. M. Bailey); "a slow drawling song suggesting song of White-crowned Sparrow" (S. S. Gregory, Jr.); " a long, drawling, monotonous and solemn note *te de de de de*" (Nuttall).

Breeding. — Among dwarfed spruces near timber-line. *Nest:* On ground; of dried grasses. *Eggs:* Unknown.

Range. — Central North America. Probably breeds in Hudsonian Zone from Fort Churchill (northern Manitoba) to Great Bear Lake (northwestern Mackenzie); winters from southern British Columbia, southern Idaho, eastern Colorado, southern South Dakota and southern Minnesota (casually) south to southern Texas; in migration ranges east to western Ontario and eastern Illinois and west to British Columbia and central Montana; casual in Michigan, Indiana, Wyoming, California and Oregon; accidental in New Mexico, Arizona, Ohio, southeastern Ontario and Massachusetts.

Distribution in New England. — Accidental visitor. One record: *Massachusetts:* Hingham, a young female first seen April 11, 1929, by Mr. and Mrs. Fred G. Floyd, taken April 21, 1929, by Dr. John B. May and now in collection of Boston Society of Natural History.[2]

Haunts and Habits. I am writing this on April 28, 1929. Ninety-five years ago today Thomas Nuttall collected the first specimen of this handsome species known to science, between Independence and Westport, Missouri, not far from the border of Kansas. Fifteen days after Nuttall's discovery, Maximilian, Prince of Wied, also collected

[1] Bird-Lore, Vol. XV, 1913, p. 304.

[2] Auk, Vol. XLVI, 1929, p. 392.

one of these birds on the Missouri River. It was not until 1840, however, that Nuttall published his description of the "Mourning Sparrow" as he called it. On May 4, 1843, nine years after Nuttall's discovery, Audubon and his friend Edward Harris were near Fort Leavenworth, Kansas, when the latter collected a sparrow which Audubon thought a new species and which he therefore named "Harris's Sparrow."

Surprisingly little has been learned about the life history of this strikingly handsome bird. Its breeding habits are known only from a nest containing nearly fledged young which was found by Ernest T. Seton, August 5, 1907, in the Barren Lands of Canada near Great Slave Lake,[1] but its migrations have been studied at some length.

Alexander Wetmore says of the Harris's Sparrow: "In summer it nests in a more or less unknown region in the Hudsonian Zone, from Fort Churchill on Hudson's Bay westward, possibly to near Great Bear Lake. In September and early October it migrates south to a wintering ground from northern Kansas south to northern Texas. Migration is almost directly south and extends only through a comparatively narrow area along the eastern edge of the Great Plains. Stragglers come to eastern Colorado on the west and central Wisconsin and Illinois on the east, but the full migration centers through a narrow region comprising eastern Kansas and western Missouri. Here this fine bird swarms in thickets and hedgerows during October, and again in April, filling the air with its rollicking whistled calls. At the height of the migration thousands may be seen in a single day, but outside this strip, which is barely 250 miles wide, the bird is casual or rare. The cause for this limited distribution is wholly obscure, for areas at either hand seem equally suited for the needs of the bird, which has the habits of its congeners. No other bird has this distribution, which lies along the lines where forms of the eastern half of the country begin to disappear and those of the west to appear." [2]

On the evening of April 20, 1929, my friend Mr. Fred G. Floyd of Hingham, Massachusetts, telephoned me that a strange bird had been at the feeding shelf outside his dining room window daily for about ten days. From his excellent description I suspected the presence of a Harris's Sparrow, a bird hitherto unknown in New England.

The next morning, April 21, I called at Mr. Floyd's home and after waiting about an hour I was rewarded by a brief glimpse of a large, rather long-tailed sparrow, which visited the feeding place with noticeably smaller Song Sparrows and Slate-colored Juncos. Another hour was occupied in following the bird about the neighborhood, before it was collected. In flight the bird appeared lighter brown above than the Song Sparrows with which it associated, so that it was fairly easy to follow the bird, in spite of a pouring rain which obscured my glasses whenever I tried to study the bird closely. Frequently it flew into a thick bush and then worked its way up to the top branches to look around, at which time its size, its long tail, and its erect posture were very suggestive of its congener, the slightly smaller White-crowned Sparrow. The dark unstreaked forehead and the black blotches on the throat and upper breast, were also noticeable.

The bird was first noted by Mr. and Mrs. Floyd on April 11, 1929, following a storm

[1] Auk, Vol. XXV, 1908, p. 72.

[2] Wetmore, Alexander: The Migrations of Birds, 1926, pp. 202, 203.

with snow and rain and strong winds, which, according to Mr. G. A. Loveland of the Weather Bureau in Boston, originated in an area of low pressure west of the Great Lakes on April 5. This storm passed across Nebraska and Kansas, where the Harris's Sparrow is abundant at this season, then crossed the Great Lakes and traveled down the St. Lawrence Valley, passing out to sea on April 9. It is quite probable that this unexpected visitor was brought east by this storm, which was accompanied by high winds throughout its course.

The food of the Harris's Sparrow during its migration and in its winter home has been studied and reported by Dr. Sylvester D. Judd. In an examination of 100 stomachs he found the food to be 92 per cent vegetal and only 8 per cent animal. Leaf-hoppers comprised 2 per cent of its food and it also ate other insects, spiders and snails. About 10 per cent was grain, chiefly waste kernels; 42 per cent was seeds of ragweed and polygonum; the balance was made up of miscellaneous weed seeds, grass seeds, wild fruit, etc.[1] The nestlings are probably fed largely upon insects.

Economic Status. From the above examination Dr. Judd believed the Harris's Sparrow should be afforded all possible encouragement and protection, as a decidedly beneficial bird.

Zonotrichia coronáta (Pallas). Golden-crowned Sparrow.

Description. — Crown more or less yellow. *Adult male:* Broad median line on top of head olive-yellow or dull golden-yellow, changing rather abruptly to ashy-gray on occiput, bordered by broad black line; forehead and lores black; small yellow spot over eye; general color of upper parts grayish-olive-brown, back and scapulars broadly streaked brownish-black, these streaks with more or less marginal suffusion chestnut-brown; middle and greater wing-coverts tipped white, making two distinct wing-bars; edge of wing yellow; sides of head dull grayish, sometimes flecked dusky; under parts dull brownish-gray, paler on chin and throat, almost white on abdomen; sides and flanks light buffy-brown, sometimes faintly streaked; under tail-coverts light grayish-brown or drab; tail and flight-feathers hair-brown, edged lighter; bill blackish, below gray tinged green at base (A. Brooks); iris brown; legs and feet pale reddish-ochre. *Adult female:* Similar to male, sometimes hardly distinguishable, but black stripes on side of crown usually narrower and less intensely black, yellow of crown paler, gray of crown more or less streaked dusky. *Young in first winter plumage:* Similar to adult female but whole forehead and anterior part of crown yellowish-olive, more or less flecked dusky, posterior part grayish-olive-brown, streaked dusky, or like back; sometimes more or less indication of black lateral stripes. *Young in juvenile plumage:* Upper parts resemble juvenal Song Sparrow; breast streaked (F. M. Chapman).

Golden-crowned Sparrow, Adult.

Measurements. — Length 6.00 to 7.50 in.; spread about 9.50; folded wing 2.90 to 3.40; tail 2.70 to 3.40; bill .45 to .53; tarsus .92 to 1.02. Female slightly smaller than male.

Molts. — Immature or first winter plumage attained by complete molt of body plumage and wing-coverts, the nestling wings and tail being retained; the prenuptial molt (March, April), appears to be restricted to head, throat, breast, tertials and middle tail-feathers, which now acquire colors of breeding bird.

[1] United States Department of Agriculture, Division of Biological Survey, Bulletin No. 15, 1901, pp. 68, 69.

FIELD MARKS. — Size between Song Sparrow and Fox Sparrow; the large size, rather long tail and dark coloration, with the slightly olive cast to upper plumage and presence of yellow on crown, distinguish this bird in all except the juvenal plumage; crown of adult is very striking in its contrast of broad, velvety-black, lateral stripes with the broad median line which is yellow anteriorly and ashy-gray posteriorly; crown of immature bird lacks black and yellow is much obscured with dusky but can be detected in the field.

VOICE. — "Two distinct call notes — a fine, lisping *tsip! tsip!* and a sparrow-like chirp — *chip! chip!* (C. Keeler); calls, a high-pitched *chirp* or *tschip* and a nasal *tss* (W. L. Dawson); "a plaintive whistled song of three notes, to the tune of 'Three Blind Mice,' more poetically rendered, 'Oh, dear me!' each note an interval lower in pitch than the preceding" (R. Hoffmann); a sweet two-syllabled song of rising inflection, *hoo-heé* (W. L. Dawson).

BREEDING. — In alpine meadows. *Nest:* On ground; of fine grasses and rootlets. *Eggs:* Usually 5; about .85 by .65 in.; pale greenish-blue varying to brownish, spotted with reddish-brown, resembling the more distinctly spotted type of eggs of the White-crowned Sparrow.

RANGE. — Pacific coast region of North America. Breeds from Kotzebue Sound in northwestern Alaska, south to Shumagin Islands, Alaska Peninsula and Kadiak Island in Alaska, central British Columbia and central-western Alberta; winters from southwestern Washington south throughout California, chiefly west of the Sierra Nevada, including the Santa Barbara Islands, to northern Lower California and casually to Guadalupe Island; in migration east to central-eastern Alaska and straggling east to Nevada and Colorado; accidental in Wisconsin and Massachusetts.

DISTRIBUTION IN NEW ENGLAND. — Accidental visitor. Records: *Massachusetts:* Bedford, January 26, 1928, a male in first winter plumage, collected by Dr. John B. May and now in mounted collection of Boston Society of Natural History.[1] *Connecticut:* Glastonbury, April 25, 1929, a single adult bird seen by Miss Edith M. Clark.[2]

HAUNTS AND HABITS. The Golden-crowned Sparrow during the migrations and in its winter haunts in the United States, is an inhabitant of wooded canyons, of chaparral-covered slopes and of bushy stream borders. It is sometimes found in mixed flocks with its relatives, the White-crowned, White-throated and Harris's Sparrows, but it is usually more retiring or secretive in disposition, although Mr. Charles L. Whittle reports it as found in the shrubbery about the hotel where he stayed in Victoria, British Columbia, and in San Francisco and other California cities it is often seen on city lawns.

The adult Golden-crowned Sparrow is a strikingly handsome bird. Like the White-crowned Sparrow, it is inclined to carry its head high, in a regal manner quite fitting a "crowned" sparrow. During the fall and early winter it is a rather silent bird, its presence in the undergrowth being betrayed more often by the sound of its scratching of dead leaves than by vocal evidence. But as spring approaches, the clear, sweet, high-pitched songs of the Golden-crown may be heard, as it prepares for its departure to its breeding haunts in Alaska and northwestern Canada.

On January 25, 1928, Mrs. John C. P. Riese, of Bedford, Massachusetts, telephoned me that an immature Golden-crowned Sparrow had been a visitor at her feeding station on the two preceding days. She gave an excellent description of the bird, which she had known previously from visits to the Pacific coast. The next day, in company with Mr. Maurice Broun, I visited Bedford. The bird had not returned to the home of Mrs.

[1] Auk, Vol. XLV, 1928, pp. 222, 223.

[2] Clark, Miss Edith M.: *in litt.*

Riese on January 25, but had made several calls at the feeding station of her neighbor, Mrs. Wallace Webber. We visited both these places without result and then began a systematic scouting of the surrounding country. Finally, in the interesting gardens of Mrs. C. W. Willis, we found the bird we sought, feeding with a flock of English Sparrows. After watching it for some time at close range, permission was sought and granted, to collect the specimen "for scientific purposes."

After comparing the specimen with skins in the collection of the Museum of Comparative Zoölogy at Cambridge, it was presented to the Boston Society of Natural History, where it was mounted and is now part of the collection of New England birds. When dissected it was found to have a partly healed but discharging wound on its side, probably caused by striking against some obstacle during the high winds which prevailed a few days before its capture, and it is doubtful if it would have long survived. Mrs. Riese deserves much credit for her prompt identification of this visitor, so far from its normal habitat, and which otherwise might have died unnoted.

On April 25, 1929, Miss Edith M. Clark, a member of the Hartford Bird Study Club, saw, at Glastonbury, Connecticut, an adult Golden-crowned Sparrow. The bird, which was in a mixed company of White-crowned and White-throated Sparrows, allowed a close approach and a careful observation "for at least five minutes." Every marking was noted and contrasted with those of the two other species of *Zonotrichia* with which it was associated, and the bird was accurately described by Miss Clark in her letters to me so that I have no doubt of the correctness of her identification. Following the precedent of Mr. Forbush when no specimen has been taken, this species must be placed on the "hypothetical list" for Connecticut.

The only other records of this species, east of Colorado and Nevada, are those of three specimens which were taken in Wisconsin about seventy-five years ago.[1]

The food of the Golden-crowned Sparrow has not been studied on its breeding ground, but Professor F. E. L. Beal reported upon the examination of 184 stomachs collected from October to April in California. At that time less than one per cent of its food was animal matter, though it is probable that like other sparrows, it eats many insects during the summer. The vegetal content consisted of fruit, buds and flowers, grain and some miscellaneous matter, as well as weed seeds, which latter totaled 33 per cent of the entire food.[2]

Economic Status. The Golden-crowned Sparrow feeds quite largely upon buds while in the United States and where orchards and gardens are scientifically pruned, may cause some loss. It also eats tender shoots of garden vegetables. It eats much waste grain after harvesting, but is accused of eating seed grain in the planting season. Its value as a destroyer of weed seeds, however, probably far outweighs any damage it may do.

[1] Hoy, Dr. P. R.: Proceedings of the Natural History Society of Wisconsin, March, 1885, p. 7.

[2] United States Department of Agriculture, Bureau of Biological Survey, Bulletin No. 34, 1910, pp. 78, 79.

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